



DEALING WITH DIABETES

With rates on the rise, experts discuss the role of nutritional therapy



A GUIDE TO ANTIOXIDANTS

The essential role of antioxidants in health

IMMUNITY UNDER ATTACK

A practitioner guide to addressing low immune function

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Welcome



The data around the incidence of type 2 diabetes shows that more people than ever before are at risk of developing this chronic disease. And it only appears to be on the rise, and if nothing changes, more than five million people will have diabetes in the UK by 2025. The fact is that, when it comes to type 2 diabetes, we are doing it to ourselves, given the modifiable factors related to it.

Type 2 diabetes – both reducing risk factors but also addressing the condition – is something that responds incredibly well to

nutritional therapy and it is this subject that is our focus for the latest issue of *Nutrition I-Mag*, in which experts discuss the correct approach for Nutritional Therapists to take. [Click here](#) for the full story.

As a magazine designed for students and recent post-graduates, we are committed to ongoing education and so we also take a look at another successful year for the IHCAN Conferences, a series of educational events presented by a host of well-respected experts in the field.

As well as the events, which are held at the Cavendish Conference Centre, there is also the IHCAN webinars, which take place each month on different themes and allow you to top up your CPD points by logging on and watching. We have a constant programme of webinars through the year; you can [click here](#) to find out the forthcoming webinars, and log onto www.ihcanconferences.co.uk/webinars to register.

Rachel

RACHEL SYMONDS, EDITOR

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NUTRITION I-MAG GIVEAWAYS

Food is the future of medicine

Make your future with *the* home of nutritional therapy education

Nutritional Therapy Diploma Courses (NTDC)

Join the nutrition revolution and become a Registered Nutritional Therapist and make a difference to people's lives. Our courses combine the latest theoretical knowledge from the science of nutrition with real-world clinical training to build an in-depth understanding of the role nutrition plays in human health and well-being.

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OUR CONTRIBUTORS

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



Tracey Hanley

Tracey Hanley is a Registered Nutritional Therapist at Cytoplan, who uses her qualifications in psychology, philosophy and coaching to complement her practice. She is committed to the application of personalised functional nutrition to assist her clients in feeling good again. Tracey currently runs a corporate and private clinic in London, where her practice centres on gut health, mood stabilisation and improvement, and women's wellness, with a particular interest in hormonal issues.



Kasey Hutchinson

Kasey Hutchinson is a registered dietitian and content specialist for Microbiome Labs, an innovative company establishing new frontiers in functional medicine and probiotic spore supplementation. Kasey completed her dietetic coursework and internship at Montana State University, where she graduated with honours. When she is not reading the latest research on GI health or submerged in content creation, you can usually find her exploring in nature's backyard, the Rocky Mountains of Montana.



Attila Földi

Attila Földi, is a Hungarian expert Mycologist, specialising in medicinal mushrooms. He is a member of both the British and Hungarian Mycological Societies and author or co-author of two books, mycotherapy related booklets, mycotherapy specialised articles and informative documents about Traditional Chinese Medicine (TCM), among others. He was an invited speaker at the UK Medicinal Mushroom Conference (2017 and 2019).



Aicacia Young

Aicacia Young, RDN is a Registered Dietitian Nutritionist in Austin, Texas. After receiving her undergraduate degree in traditional nutrition, Aicacia worked in the field of Functional Medicine, where she was trained by a functional MD to help patients from all over the USA treat and reverse a wide variety of autoimmune conditions through diet and supplementation. Aicacia now serves as the Director of Scientific Affairs at Microbiome Labs, where she stays up to date with the latest research concerning the gut microbiome.



Dr Elisabeth Philipps

Dr Elisabeth Philipps DPhil BSc (Hons) BSc Nut Med FNTF is a renowned nutritional consultant and experienced speaker. She has years of clinical experience running her own private practice, alongside managing practitioner training for Nutrigold and delivering corporate client wellbeing programmes around the country.



Katherine Pardo

Katherine Pardo BSc (Hons), Dip ION is Head of Nutrition at nutritional supplement company Nutri Advanced, one of the leading educators in the field of Functional Medicine. She originally trained as a Nutritional Therapist at the Institute for Optimum Nutrition in London and is committed to helping people make realistic and sustainable food and lifestyle choices for improved health and wellbeing.

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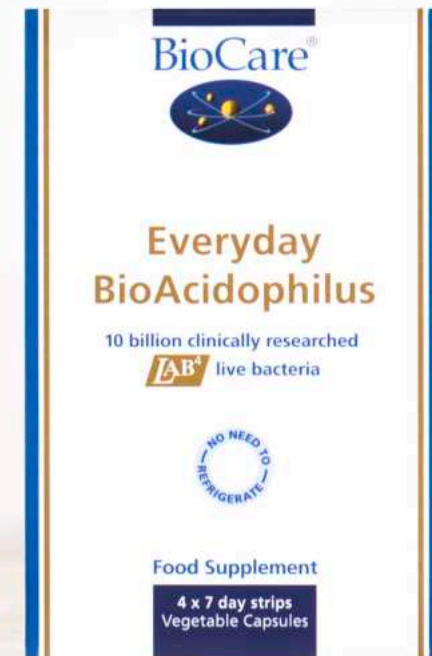
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News bites

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

Ingredients company renamed one year after acquisition by Cambridge Commodities

It has been announced that Cambridge Commodities has formed a global corporate name one year after acquiring Earth Circle Ingredients.

UK-based ingredient company, Cambridge Commodities, acquired the US wholesaler, Earth Circle Organics LLC, last year and has now announced that as of August 1, the business changed its corporate name to Cambridge Commodities Inc. The business will combine the US and UK companies under the Cambridge Commodities group. Cambridge Commodities Inc is part of the global Cambridge Commodities Group, specialising in supplying nutritional ingredients and developing finished products to the food and beverage, sports nutrition, health and wellbeing and pet and equine industries.

Commenting on the business name change, James Stevens, Cambridge Commodities CEO, explained: "One team is so important. It's been an integral factor for the UK and European team for so long now, therefore, integrating the US is going to be the dream. We can bring so many strengths from Europe and they can bring so many from the US. A truly global team is what I want."

The expansion means the American market will benefit from more than 250 ingredients, a larger stock holding facility at the

new warehouse and continuation of great customer service to improve wellbeing worldwide.

CEO at Cambridge Commodities Inc, Keith Bearden, who brings over 20 years' experience in food and beverage to the company, added: "We are excited to formally be identified as part of the Cambridge family. While it was important to retain our heritage with our Earth Circle customers as part of the transition, we are now pleased to be able to demonstrate to them the global capabilities of the Cambridge Group of companies. This also solidifies the relationships between the offices in the US and the UK in a way that makes everyone feel part of one team all working toward a common goal – quality ingredients for quality products."



Food sensitivity testing focus in new book

A new book from an experienced naturopath aimed to educate people on the principles of bioresonance and biofeedback therapy.

Julie Langton Smith MSc is a highly experienced naturopathic specialist, with more than 20 years' experience of working with both individuals and companies, and has penned *Food Sensitivity Testing*.

The book is described as the first and only book about food sensitivity testing using the new science of bioresonance, an alternative technique identifying vibrational energy from a hair sample using specialist medical scanning devices.

The book investigates the subject of food intolerances, sensitivities and allergies using bioresonance/biofeedback therapy. It will demonstrate the practice of food testing for a patient and help a practitioner understand how to produce a food elimination plan for the patient and includes a guide to bioresonance devices and how to use one to test for intolerances.

Lord Lieutenant of Hampshire presents OptiBac with Queen's Award

Following the news that OptiBac Probiotics had secured a prestigious Queen's Award for Enterprise, the company has been presented with the accolade by the Lord Lieutenant of Hampshire.

The probiotics brand, based in Andover, hosted a prestigious ceremony recently to celebrate being awarded The Queen's Award for Enterprise for international trade.

The family-run business welcomed the Lord Lieutenant of Hampshire, Nigel Atkinson Esq, to present the award to the company in its very own warehouse, where he was joined by other distinguished guests, including the Mayor of Andover and local MP, Kit Malthouse.

Jalal Janmohamed founded OptiBac Probiotics in 2004 with his sisters, Soraya and Farah, inspired by their father, who was a successful community pharmacist in Andover and was the one who gave the siblings their entrepreneurial spirit

and passion for health and wellbeing, particularly for natural products.

Jalal commented: "It is a great honour to accept the Queen's Award for Enterprise in the international trade category from the Lord Lieutenant, right here in Andover where our journey began. We appreciate the time he took to come and meet the OptiBac Probiotics family and for his thoughtful speech.

"We all grew up around this area and this is where we feel at home – we have a small office in London, but Andover remains HQ. We employ an excellent group of people and think our team match the talent of any large multi-national organisation out there. Winning this award has been a huge collaborative effort from everyone who works here, and we're delighted to host this special event as a way to celebrate this achievement with everyone who made winning this award possible."



New CPD accredited course launched by Pharma Nord

A comprehensive CPD-accredited distance training programme on supplementation has been announced by Pharma Nord.

The nutritional supplement brand has launched what it calls the country's most comprehensive CPD-accredited distance training programme on supplementation, covering supplements including vitamin D, Q10, magnesium, fish oil, omega 7 and vitamin K.

Every module in the programme has been assessed and approved by the CPD Certification Service, meaning that all those who follow a module will earn Continuing Professional Development (CPD) points. Each participant will receive a CPD accreditation certificate each time they successfully complete a module to display as evidence of their expertise in the field.

Bent Henriksen OBE, Managing Director of Pharma Nord UK, commented: "We believe this is the most detailed and comprehensive supplement distance CPD training programme ever created in the UK. It sets a new standard for officially accredited training for people in the health food sector about a hugely important part of their business.

"We know from more than three decades in the industry that customers value the knowledge and expertise which they can get from health food stores about how supplements work, and which products are best suited for their health needs."

The programme has been devised and put together by Pharma Nord UK's Senior Nutritionist, Frankie Brogan. An accredited



Frankie Brogan

nutritionist with a Master's degree in Nutrition and more than a decade in the industry, Frankie drew on his experience delivering training to groups including doctors, nurses, pharmacists, practitioners and sales teams around the UK to produce the programme.

Frankie said: "Each module can be completed at an individual's own pace and in their own time, meaning that staff don't have to spend time away from the shop floor in order to expand their knowledge. Stores and individuals can choose how many and which modules to take, from one or two modules on particular products to the entire programme. Successfully completing each module will give participants CPD points, as well as increasing their store of knowledge."

In Research

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

Systematic review suggests fish oil supplementation has no effect on type 2 diabetes

Researchers have found that omega 3 supplements have no effect on type 2 diabetes as part of a peer reviewed, systematic review.

The new study, from University of East Anglia and published in the *British Medical Journal*, was part of a systematic review commissioned by the World Health Organization and found that omega 3 supplements offer no benefit to type 2 diabetes.

The systematic review combined the results of 83 randomised controlled trials involving 121,070 people with and without diabetes, all of at least six months duration. Participants included men and women, some healthy and others with existing diabetes, from North America, South America, Europe, Australia and Asia, in studies published from the 1960s until 2018. The research assessed the effects of increasing long-chain omega 3 fats, ALA, omega 6 and polyunsaturated fatty acids (PUFAs) on diabetes and glucose metabolism.

Participants were randomly assigned to increase their polyunsaturated fats or to maintain their usual intake for at least six months, with the researchers finding that there was clearly no effect of increasing long-chain omega 3 fats on diabetes, but there was insufficient information from trials of ALA, omega 6 or total polyunsaturated fats to assess either protective or harmful effects.

The results show that increasing long-chain omega 3 had little or no



effect on diabetes diagnosis or glucose metabolism, but high doses, at levels found in some supplements, could worsen glucose metabolism.

Lead author, Dr Lee Hooper, from UEA's Norwich Medical School, commented: "This large systematic review included information from many thousands of people over long periods. Despite all this information, we don't see protective effects. The most trustworthy studies consistently showed little or no effect of long-chain omega 3 fats on diabetes."

Joint first author, Dr Julii Brainard, also from Norwich Medical School, added: "Oily fish can be a very nutritious food as part of a balanced diet, but we did not find enough trials that encouraged participants to eat more oily fish to know whether it is useful in preventing diabetes or improving glucose metabolism. What we did find is that there is no demonstrable value in ordinary people taking omega 3 oil supplements for the prevention or treatment of diabetes."

"We would also have liked to find out whether taking more omega 3 might be useful in those people with low omega 3 intakes – as giving more omega 3 is more likely to be useful in adults with low intakes. But unfortunately, most trials didn't report omega 3 intake levels of participants at the start of the trial, so we still don't know. Future trials need to measure and assess baseline omega 3 intakes and assess effects of eating more oily fish – not just supplements."

Choline associated with reduced risk of dementia

A study at the University of Eastern Finland has found that dietary choline is linked with reduced risk of dementia.

Researchers say the study is the first to observe that dietary intake of phosphatidylcholine is associated with a reduced risk of dementia, and was also linked to enhanced cognitive performance, with the main dietary sources of phosphatidylcholine being eggs and meat.

The findings, published in the *American Journal of Clinical Nutrition*, demonstrated that the risk of dementia was 28 per cent lower in men with the highest intake of dietary phosphatidylcholine, when compared to men with the lowest intake. Men with the highest intake of dietary phosphatidylcholine also excelled in tests measuring their memory and linguistic abilities.

These findings were considered significant, considering that more than 50m people worldwide are suffering from a memory disorder that has led to dementia, and the number is expected to grow as the population ages.

"However, this is just one observational study, and we need further research before any definitive conclusions can be drawn," commented Maija Ylilauri, a PhD Student at the University of Eastern Finland.

The data for the study were derived from the Kuopio Ischaemic Heart Disease Risk Factor Study, KIHDS. At the onset of the study in 1984-1989, researchers analysed approximately 2,500 Finnish men aged between 42-60 for their dietary and lifestyle habits, and health in general. These data were combined with their hospital records, cause of death records and medication reimbursement records after an average follow-up period of 22 years. In addition, four years after the study onset, approximately 500 men completed tests measuring their memory and cognitive processing. During the follow-up, 337 men developed dementia.



Researchers find 10m cases of vitamin D deficiency would be prevented with fortification

A new study from the University of Birmingham has revealed that some 10m new cases of vitamin D deficiency in England and Wales could be prevented over the next 90 years by adding vitamin D to wheat flour.

In the UK, the average daily vitamin D intake is below the reference nutritional intake of 400IU per day, and 20 per cent of adults and 16 per cent of children aged between 11-18 are estimated to be deficient in vitamin D.

In light of the results, the researchers say that overhauling existing public health policy to introduce the mandatory fortification of vitamin D in wheat flour would not only be cost saving but would significantly reduce the burden on the NHS by preventing 25 per cent of the estimated 40m new cases of vitamin D deficiency over the coming 90 years. Furthermore, offering free vitamin D supplements to targeted groups of the population, including children, the elderly and Black and Asian Minority Ethnic (BAME) risk groups, would prevent an additional eight per cent of new cases of vitamin D deficiency over the next 90 years. Therefore, the combination of wheat flour fortification and targeted supplementation would in total prevent 33 per cent (13.2m) of cases of vitamin D deficiency.

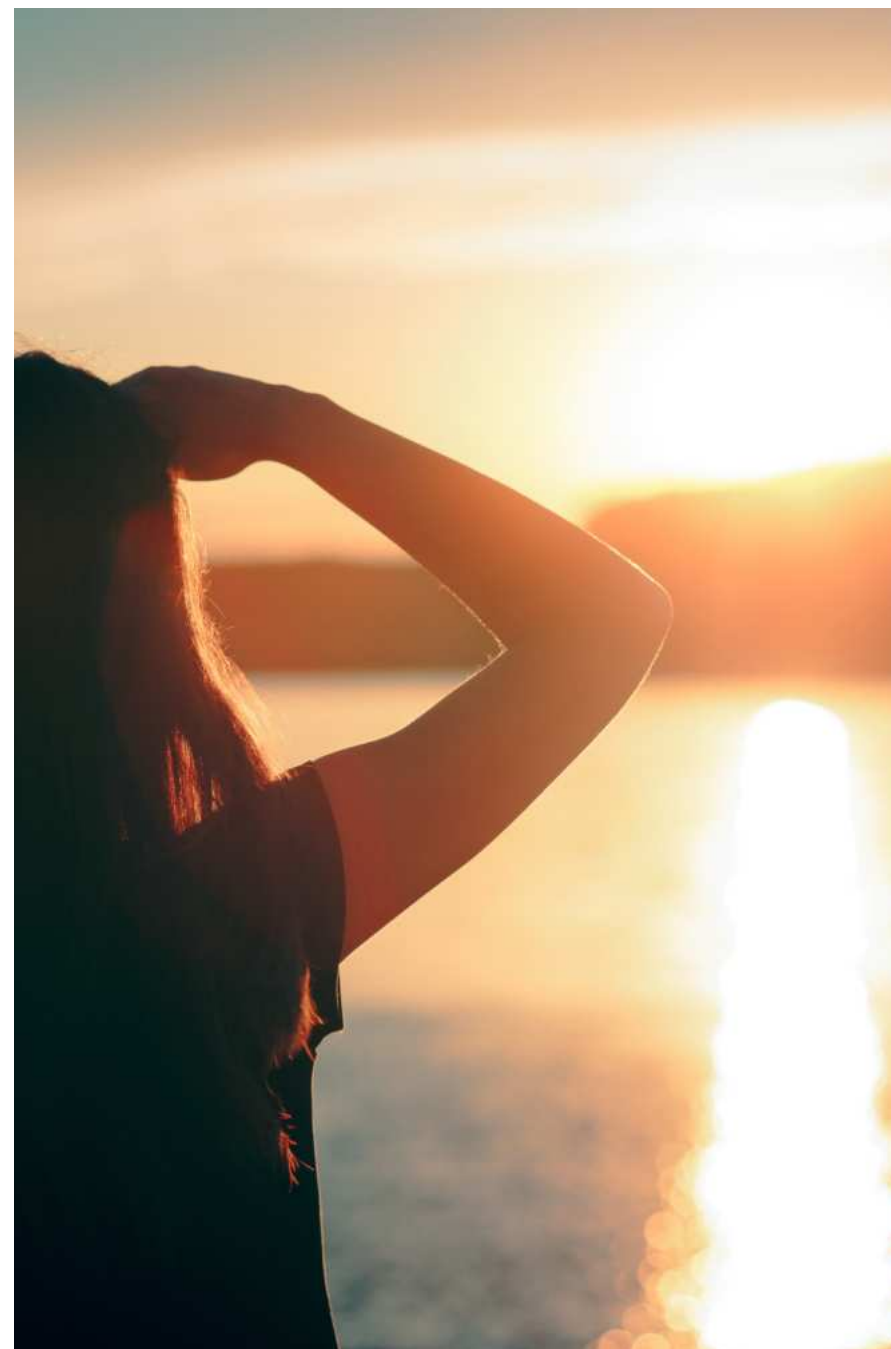
The research, published in the *European Journal of Clinical Nutrition*, was funded and led by the University of Birmingham's Institute of Applied Health Research and Institute of Metabolism and Systems Research. It concluded that fortifying flour with vitamin D alone would save the public purse £65m by reducing demand for healthcare and treatment for vitamin D deficiency and its complications.

The researchers proposed a new UK strategy to add 400IU of vitamin D per 100g of flour, while also offering free vitamin D supplements at a dose of 400IU for children aged up to 18, as well as doses of 800IU for all those aged over 65.

Dr Magda Aguiar, who carried out the research at the University of Birmingham, commented: "While both supplements and fortified foods are important sources of vitamin D for the UK population, evidence suggests current UK supplementation policies are not working. Addressing vitamin D deficiency in the UK requires a multi-disciplinary approach and preventing conditions that are the consequence of deficiency would save the NHS money to the extent that it would more than compensate for the money needed to implement flour fortification at a national level.

"We now hope that UK policy makers will consider a new national policy to fortify foods, such as wheat flour with vitamin D to address this serious health issue. This will lead to significant benefits for the population, particularly the most vulnerable groups."

Professor Emma Frew, of the University of Birmingham's Institute of Applied Health Research, who is partly supported by the National Institute for Health Research, added: "We have provided compelling evidence that a new strategy is not only safe but would also improve vitamin D intake, which in turn would enhance the health of millions in England and Wales. Our study showed that, even though supplements are still a viable option for those at a higher risk, food fortification strategies should be prioritised as a response to the rising prevalence of vitamin D deficiency, as it is a safe and cost-saving option."



New to market

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

ORGANIC TRADITIONS ADDITIONS

Two new superfood products have been added to the Organic Traditions range.

Roasted Baru Seeds offer a peanut taste without the allergens in peanuts, almonds or other tree nuts as these seeds are completely nut free, wild-crafted and hand-picked from the tropics of Brazil. Each serving is loaded with more protein than almonds, plus healthy fats, fibre, iron, and other benefits for a delicious snack, or topper to favourite meals and desserts.

Then there is Organic Superfood Instant Lattes, which are dairy free and probiotic-filled. Made with an organic coconut milk powder base, and with one billion probiotics per serving, the new latte mixes come in four flavours (Turmeric with Saffron, Matcha, Chocolate with Ashwagandha, and Beet with Fermented Beets). Just add hot or cold water and enjoy as a healthy alternative to tea or coffee or as additions to smoothies, soups and desserts.



GUT FRIENDLY FROM G&G

G&G Vitamins has further expanded its gut health range with the launch of Pro-VeFlora 50 Billion.

Suitable for vegetarians and vegans and Kosher approved, this advanced formulation contains vast amounts of different bacteria, including *B. bifidum*, *B. longum*, *L. casei*, *L. plantarum* and *L. reuteri*.



NEW LOOK UNVEILED FOR BEET IT

The makers of the Beet It organic beetroot juice have announced it has undergone a makeover.

James White Drinks, which created the brand, has unveiled what it calls a refreshing modern design for the popular beetroot juice, which has been bottled in rural Suffolk since 2005.

It features James White's new style logo, which incorporates the original calligraphy and a refreshed stylised beetroot illustration, complementing the new 'Bold by Nature' company strapline and the rich and hearty nature of the juice.



Beet It is made with just pressed organic beetroot juice, blended and with 10 per cent pressed organic apple to smooth its naturally sweet but slightly earthy taste.

GLUCOMANNAN KEY INGREDIENT IN LIFEPLAN LAUNCH

Supplement brand, Lifeplan, has announced the launch of a new product designed to support a healthy waistline.

Glucomannan Diet Support is a 100 per cent natural plant-based product and a water-soluble fibre, which is also suitable for vegans.

Made from the root of the Amorphophallus konjac plant, glucomannan has been used in East Asian diets for hundreds of years and is the only European Food Safety Authority approved weight loss aid.

Julie Lamble, Senior Nutritionist at Lifeplan, commented: "Research shows that it can help support weight loss without changing eating patterns, which can be a problem area for many. After you have reached a healthy weight, it can be used to help maintain this and prevent against unwanted weight gain."



Spore-Based Probiotic

MegaSporeBiotic is a probiotic blend of 5 Bacillus spores, clinically shown to maintain healthy gut barrier function and overall immunity. The bi-phasic life cycle of the Bacillus spores allows them to remain dormant in harsh environments until they reach more favourable environments like the human gastrointestinal tract. Once inside the large intestine, these dormant spores change into their active, vegetative forms and begin colonising in the gut. This unique probiotic blend aims to RECONDITION the gut instead of reseed with probiotic strains that cannot survive digestion or colonise the gut. MegaSporeBiotic has quickly become a favorite supplement with health practitioners. Practitioner/Student registration at www.MicrobiomeLabs.co.uk



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This synergistic formulation is ideal for women approaching the menopause who want to feel good every day. For more information visit www.savant-health.com



Support for the Menopause

Meno Support (Multi) from the Natural Health Practice has been formulated in association with Dr Marilyn Glenville PhD and is an all-round excellent multivitamin and mineral supplement in easy to swallow capsule specially formulated to help women through the menopause and beyond as well as supporting good bone health. It contains a full spectrum of nutrients including vitamin A, E and the B Vitamins, beta-carotene and selenium.

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BANTNews

The latest developments from the leading professional body for Registered Nutritional Therapists, BANT.



BANT WARNS LOWER INCOME FAMILIES' HEALTH TO BE CLOBBERED BY BANNING OF SUGAR TAX

Boris Johnson has announced that he would ban the UK's Sugar Tax as it "clobbers those, who can least afford it".

Lower income families may well be able to afford more convenience foods, but they will undoubtedly be clobbered by chronic ill-health in exchange, BANT (British Association for Nutrition and Lifestyle Medicine) warns. Whilst BANT has reservations around the Sugar Tax, a focus to support the interests of people over the financial interests of industry is paramount.

With the UK and its precious NHS crumbling under the weight of growing obesity, type 2 diabetes and other chronic conditions crisis, BANT is reacting in disbelief that a politician would prioritise purchasing power over proven all-round mortality links to ultra-processed foods and drinks (UPFD).

UPFD are constantly in the media nowadays. A series of recent scientific studies have highlighted how bad they are for human health and we at BANT repeatedly recommend that this category of foods and drinks is avoided as much as possible. In a world

where the scientific community and the media contradicts itself from one day to the next, what is the truth about UPFDs? What are they? Are they really that bad for your health?

BANT explains: "In 2013, following endless debates that the term processed foods was misleading, because every food that is prepared is processed to some degree, even from fresh ingredients at home, the NOVA Classification was defined by Brazilian researcher, Carlos Monteiro. In summary, the definition says that an UPFD is an industrialised formulation of five or more ingredients including flavour injections, sugars, chemical preservatives and fats added at the final stage of processing in an industrial food plant."

Here is the definition in full:

"Ultra-processed products are made from processed substances extracted or refined from whole foods e.g. oils, hydrogenated oils and fats, flours and starches, variants of sugar and cheap parts or remnants of animal foods – with little or no whole foods. Products include burgers, frozen pasta, pizza and



pasta dishes, nuggets and sticks, crisps, biscuits, confectionery, cereal bars, carbonated and other sugared drinks and various snack products. Most are made, advertised and sold by large or transnational corporations and are very durable, palatable and ready to consume, which is an enormous commercial advantage over fresh and perishable whole or minimally processed foods... [They] are typically energy dense; have a high glycaemic load; are low in dietary fibre, micronutrients and phytochemicals and are high in unhealthy types of dietary fat, free sugars and sodium.

"When consumed in small amounts and with other healthy sources of calories, ultra-processed products are harmless; however, intense palatability (achieved by high content of fat, sugar, salt and cosmetic and other additives), omnipresence and sophisticated and aggressive marketing strategies (such as reduced price for super-size servings) all make modest consumption of ultra-processed products likely and displacement of fresh and minimally processed foods very likely. These factors also make ultra-processed products liable to harm endogenous

satiety mechanisms and so promote energy overconsumption and thus obesity.”

European surveys show that ultra-processed foods now account for 50.4 per cent of total dietary energy, with baked goods and fizzy drinks being the most popular UPFDs. Young people from lower income families tend to be the highest consumers due to their affordability and perceived pleasure. It is understandable that if you can't afford many treats, meeting at a local, known-brand, fast-food outlet is a simple and affordable pleasure. That being said, ultra-processed foods are attractive to all consumers thanks to the massive marketing budgets weighted behind them. A recent Brazilian study showed that already by the age of six, a massive 40.3 per cent of total food intake came from UPFDs.

Recently published scientific studies looking into UPFDs and the human health connection have found many links to, amongst others, cancer, CVD, inflammatory bowel disease, respiratory disease, obesity and type 2 diabetes. The exact reasons why these foods are so bad for health are still unknown, but several theories have been and are being investigated including high levels of sugar, fat, salt, food additives, contaminants formed during high heat processing and chemicals used in packaging.

In conclusion, whilst the research community is unanimous in its findings that the ultra-processed food and drink category is bad for human health, there are still questions and inconclusive results relating to the individual ingredients that may be the triggering factors. What is likely, but not yet scientifically proven, is that the cocktail of many of these individual ingredients working in combination is the determining factor.

Whilst we do live in the 'age of convenience', thanks to the busy lives we now all lead, there are things that could be done to encourage the protection of the nation's health. BANT has repeatedly called for a revised approach to nutrition education and support. Without the reintroduction of home economics in schools, many children never learn to cook with simple ingredients and as they grow into adults, they themselves are unable to pass on any food preparation knowledge to their own children.

BANT UNSURPRISED BY 'FROM CRADLE TO GRAVE' MARKETING STRATEGIES FOUND BY PUBLIC HEALTH ENGLAND'S COMMERCIAL INFANT AND BABY FOOD AND DRINK: EVIDENCE REVIEW

BANT is shocked but unsurprised that Public Health England's (PHE) Commercial Infant and Baby Food and Drink: Evidence Review found that food manufacturers of ultra-processed foods and drinks (UPFDs) are aggressively targeting the infant and baby food and drink market.

A recent article, published by BANT, quoted studies that showed that the greatest growth in UPFD consumption can be seen in the early-year age-groups. A study investigating early year consumption of UPFDs found that 40.3 per cent of total energy intake of Brazilian six-year olds was from the UPFD category (Louzada et al., 2018).

Study after study has been published highlighting the links between UPFD consumption and all-cause mortality. BANT has repeatedly asked why the UPFD health risk is being taken so lightly and why the focus isn't returned to the promotion of simple, wholesome ingredients? Nutrition education from the earliest age needs to be translated from theoretical worksheets and limited food preparation to active cooking classes. Without the reintroduction of home economics in schools, many children never learn to cook with simple ingredients and

as they in turn become adults, they are unable to pass food preparation knowledge to their own children. The vicious cycle fuelling the reliance on ultra-processed, convenience food is well and truly established and is putting an unbearable burden on an individual's health, let alone the nation's healthcare services.

BANT continues to promote its Wellbeing Guidelines campaign to encourage British people to eat more individual ingredients and avoid ultra-processed food. Going back to some old-fashioned values, such as family meal times, and improving the nation's cooking skills to use fresh ingredients, will go a long way to help the obesity targets and health of the individuals.





TWO IHCAN CONFERENCES LEFT FOR 2019

With only two events left for the 2019 IHCAN Conference series, we look back over a successful year.

The 2019 IHCAN Conference series has been the best yet and draws to a close in November.

Throughout 2019, we've welcomed Tom O'Bryan, Allison Siebecker, Dr Nigel Plummer, Dr Tanja Werner and many more through the doors of the Cavendish Conference Centre, in London, for a number of sell-out conferences and we are excited for the final two of the year, taking place on September 14 and November 23. Both of these conferences are now sold out, but you can find out more about them and how to be added to the waiting lists below.

For the September event, we are welcoming back Dr Dale Bredesen, who will reveal the latest iteration of his nutrition-based, personalised, precision medicine approach that has succeeded in reversing cognitive decline and further steps needed to make Alzheimer's a rare disease. He will look into the background of prevention and reversal of cognitive decline, as well as Alzheimer's treatment, and the future of prevention for neurodegenerative diseases.

To add yourself to the waiting list for this conference, visit www.ihtcanconferences.co.uk/september-2019

The last conference of the year takes place on Saturday, November 23, where we will be joined by Patrick Holford BSc, DiplON, FBANT, NTCRP, and Dr Elisabeth Philipps as they individually present on the topic of 'Two approaches to gut, brain and immunity: CBD and the Hybrid Diet for repair and regeneration'.

Patrick is a leading spokesman on nutrition and founder of the Institute for Optimum Nutrition and Food for the Brain Foundation. He is the author of 40 books, translated into over 30 languages, including his latest book, *The Hybrid Diet*, co-authored with award-winning medical journalist, Jerome Burne. He will present two sessions on the day, 'The Mind Matrix – how to reclaim your brain', and the second session, 'You are Hybrid'.

To be added to the waiting list for this conference, visit www.ihtcanconferences.co.uk/november-2019

DOWNLOAD THE CONFERENCES SO FAR

Every conference that takes place is recorded and can be purchased for £50, which includes access to the video, presentations and audio and available to download to a PC, Mac or mobile device.

Our 2019 conferences have seen Dr Nigel Plummer present latest findings on the microbiome, Tom O'Bryan's presentation, called 'Closing the Gates To Brain Deterioration', and 'SIBO queen', Allison Siebecker, along with Ben Brown, discussing all things SIBO and IBS earlier in May. The September and November conferences will also be available for download after they have taken place. All of these and more from 2019 and previous years can be purchased by visiting www.ihtcanconferences.co.uk/2019-downloads



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A PRACTITIONER GUIDE TO IMMUNITY

A poorly functioning immune system can manifest in many different ways in relation to our health. Here, leading experts suggest protocols when dealing with clients.

A poorly functioning immune system is not only incredibly common, but it also shows itself in some really obvious ways. And, as we head into the colder months, which brings with it the influx of viruses and cold bugs, it's imperative to educate your clients around how and why they need to strengthen this important system.

"When left unchecked for some time, dysregulation of the immune system can lead to more serious health issues, such as auto-immunity, where immune self-tolerance has been lost to such an extent that the immune system starts to

attack the body's own cells, incorrectly identifying them as foreign invaders¹⁻³," pointed out Nutritional Therapist, Hannah Braye, Technical Advisor at Proteixin, which has the Bio-Kult and Lepicol brands in its portfolio.

"A further serious consequence of immune dysregulation is an increased risk of developing cancers.¹ We require the innate immune system to remain constantly vigilant, not only against foreign pathogens but also to spot mutated cells that are constantly being produced by the body and, if left unchecked, can become cancerous. These cells must then be destroyed appropriately by the acquired immune system and immunological memory developed.⁴ When the immune system is compromised, this vital function of immuno-editing becomes less efficient.

Benjamin Brown ND, naturopath, nutritionist, science writer, speaker and Director of Clinical Education at Pure Encapsulations, added: "More frequent colds in winter months have been attributed to a couple of factors, in particular, spending time indoors and thus closer proximity to people and greater likelihood of transmitting infections. Declining vitamin D levels are also thought to play a role as vitamin D plays a critical role in resistance to infection, for example, it is essential to the production of cathelicidin-related antimicrobial peptides produced by macrophages and leukocytes. It's my own theory, but our lifestyle and diet changes in winter so less time outdoors, exercise and fresh fruits and vegetables could also play a role."

Keeley Berry, Nutritional Expert and New Product Development Executive at BetterYou, continued: "While it's not inevitable that we will all suffer from colds around this time, those with poorer immune systems are more likely to be susceptible to infection. Changes in our dietary habits may also impact our vulnerability to germs. We tend to alter our behaviour and diet from spring/summer and autumn/winter and opting for comfort foods in the winter months may impact the amount of immune-boosting nutrients we consume, affecting the immune system's ability to fight infection."

THE COLD FRONT

Our immune systems work all-year round, busy fending off infection. So, although immune supportive approaches are needed all the time, we need additional support during autumn and winter.

"Many people complain of more frequent colds through the autumn and winter and this can be in part due to the colder air that better enables the spread of viruses that cause the common cold. What many people don't realise is that it may also be linked with lower vitamin D levels," advised Sarah Sharpe, Nutritional Therapist at Nutri Advanced. "Vitamin D supports both the innate and adaptive immunity. When vitamin D levels are low, the immune system is less able to cope with the presence of viral infections."

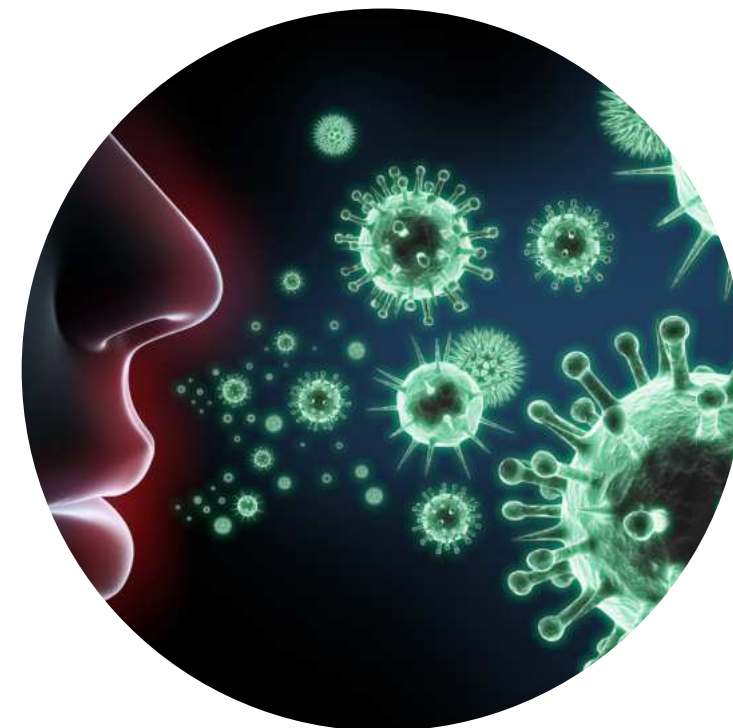
Nutritional Therapist, Jenny Logan, Technical Training Manager at Natures Aid, continued: "Viruses do not replicate well in high UV, so summer weather tends to keep them under control. Also, the rhinovirus and coronavirus, which are the two main agents of the common cold, flourish in cool weather ⁽¹⁾."

For Attila Földi, an experienced Mycologist at Hifas da Terra, there are a number of factors.

"People spend more time indoors and closer to each other during the winter. Children are in school and sharing germs with many more children than they do during the summer. The viruses that cause the common cold spread more easily in cold, dry air. Our nasal passages are drier during the winter (due to drier air), allowing cold viruses to take hold and make us sick better than they can during the spring and summer months," he advised.

Braye added: "Another common theory is that rhinoviruses (which account for more than three quarters of viruses circulating in early autumn)⁶ are better suited and, therefore, more prolific in the cooler weather. Low levels of vitamin D seen in the population during the winter months, drier, indoor climate and more time spent indoors in proximity to others, allowing for easier disease transmission, may also play a role."

Penny Shaw, Nutritional Therapist at G&G Vitamins, pointed



towards the fact there are simply more bugs around.

"During the winter, the immune system works hard to fight off infections. In this season, the air is dry and cold and therefore will hinder the effects of our first line of defence, allowing viruses and bacteria to easily invade. Dry mucous membranes in cold noses can leave a weakened defence against bacteria, causing those nasty winter colds. It's tempting to turn the shower temperature up and run a hot bath, but these can be drying and damaging to the skin," she advised.

CLIENT ASSESSMENT

Given that immune health is such a vast area, encompassing many different aspects, there is a wide portfolio of symptoms that relates to it.

"When the immune system is under pressure, the warning signs



can sometimes be hard to spot. Whilst the presence of allergies, frequent occurrence of infections or bouts of illness may be an obvious sign, problems with the immune system can also lead to chronic low-grade inflammation too, which can be harder to spot. Symptoms that a client might display when in an inflamed state are more likely to be linked with fatigue, blood sugar imbalance, hormonal imbalances and gut problems,” Sharpe advised.

Kasey Hutchinson, from Microbiome Labs, added: “Common signs of a poorly functioning immune system include frequent and recurring illness, skin infections, diarrhoea, loss of appetite, fatigue, poor wound healing and even heightened emotional

sensitivity. These are great clues into immune function. Also consider lifestyle factors such as chronic stress, micronutrient deficiencies or other forms of malnourishment.

“If a person with a weakened immune system contracts an illness, it may take weeks to fully recover. A minor cold can snowball into a recurrent episode, causing people to feel sick for several months. Similarly, repeated skin, eye or gut infections may also indicate that the immune system is functioning poorly.”

And Födi added: “The primary symptom of a weak immune system is susceptibility to infection. Infections that people with a weak immune system often get include pneumonia,

meningitis, bronchitis, skin infections, etc. The other symptoms of a weak immune system can include the following; autoimmune disorders, inflammation of the internal organs, blood disorders or abnormalities, such as anaemia, digestive issues, including digestive issues, such as loss of appetite, diarrhoea, and abdominal cramping, growth and development delays in infants and children, low energy and sinus and ear infections.”

Braye continued: “The most obvious sign that the immune system might be struggling is recurrent infections,¹ for example, colds (more than two a year), chest infections, tonsillitis, ear infections, urinary tract infections, stomach bugs, thrush, and athlete’s foot. Allergies and atopic conditions, such as eczema, asthma, hay fever and hives are also said to involve a malfunction of the immune system,² in which usually harmless substances (such as pollen, dust mites, chemicals, pet dander or foods), are misinterpreted by the immune system as being harmful, causing a heightened reaction towards them.”

COURSE OF ACTION

There are a few headline areas involved in building immunity.

“From a naturopathic perspective, prevention is always better than cure. Therefore, taking steps to support the immune system throughout the year (rather than waiting until the first signs of infection) is advisable. Deficiency of many nutrients results in altered immune responses and this is observed even when the deficiency state is relatively mild.⁷ Of the micronutrients, zinc, selenium, iron, copper, vitamins A, C, E, B6 and folate have important influences on immune responses⁷.” Braye advised.

“Testing micronutrient status with clients and working with them to improve their diet in the lead up to cold and ‘flu season will, therefore, help stand them in good stead. In addition, the phrase ‘we are what we eat’ could more accurately be expressed as ‘we are what we absorb’ so digestive function may also need to be improved in order to ensure adequate nutrient absorption.”

Födi added: “It is time to recover good habits, and not just nutritional. Sleep well, exercise can contribute to general good

health and, therefore, to a healthy immune system, healthy diet with a nutrient balanced diet and complement the beginning of the course with supplements that help eliminate excesses and prepare defences for the time of higher incidence of infections."

Adopting stress techniques is critical too.

Hutchinson continued: "Stress reduction plays a significant role in healing as well, so take every opportunity to relax. Gentle exercise is recommended, only if tolerated, to improve circulation of lymph fluid. Don't overexert yourself as this will further deplete your immune system. Consulting with a health professional is advised if regular sickness begins to severely impede your life."

Logan highlighted the importance of paying continual attention

to immunity.

"To be frank, the immune system needs to be strong and working well all year round. It is not just there to keep colds and 'flu at bay. Imbalances in the immune response lead to the development of autoimmune conditions and allergic reactions. Issues within the immune system will also lead to increased inflammation. Supporting immune health is, therefore, a cornerstone of supporting the health of the body, preventing degenerative diseases, controlling allergies and fighting infections," she explained.

EATING FOR IMMUNITY

The commonly eaten modern diet is doing our collective immune systems no good, with the influx of processed, convenience food, and on the go eating. Therefore, drawing attention to the immune beneficial foods people should be eating is imperative.

"The immune system is multi-faceted and to fully bolster its function requires a full-body approach. Nourish your body with natural foods, and get the amount of sleep, relaxation and movement that is just right for you. Tap into your body's needs as the seasons change and adapt your health routines accordingly. For example, if you are feeling that you need more rest, or your dietary preferences change, heed these insightful cues from your body," Hutchinson explained.

"A diet rich in colourful, seasonally

available produce, nuts, seeds, whole grains and aromatic spices provide an abundance of immune-supporting nutrients. Aim for a variety of plant foods and high quality protein, such as nuts, legumes and grass-fed animal products. Generally speaking, it is best to stick with whole foods to ensure adequate intake of vitamin A, B-12, folate, riboflavin, iron, copper, C, and E, zinc and selenium."

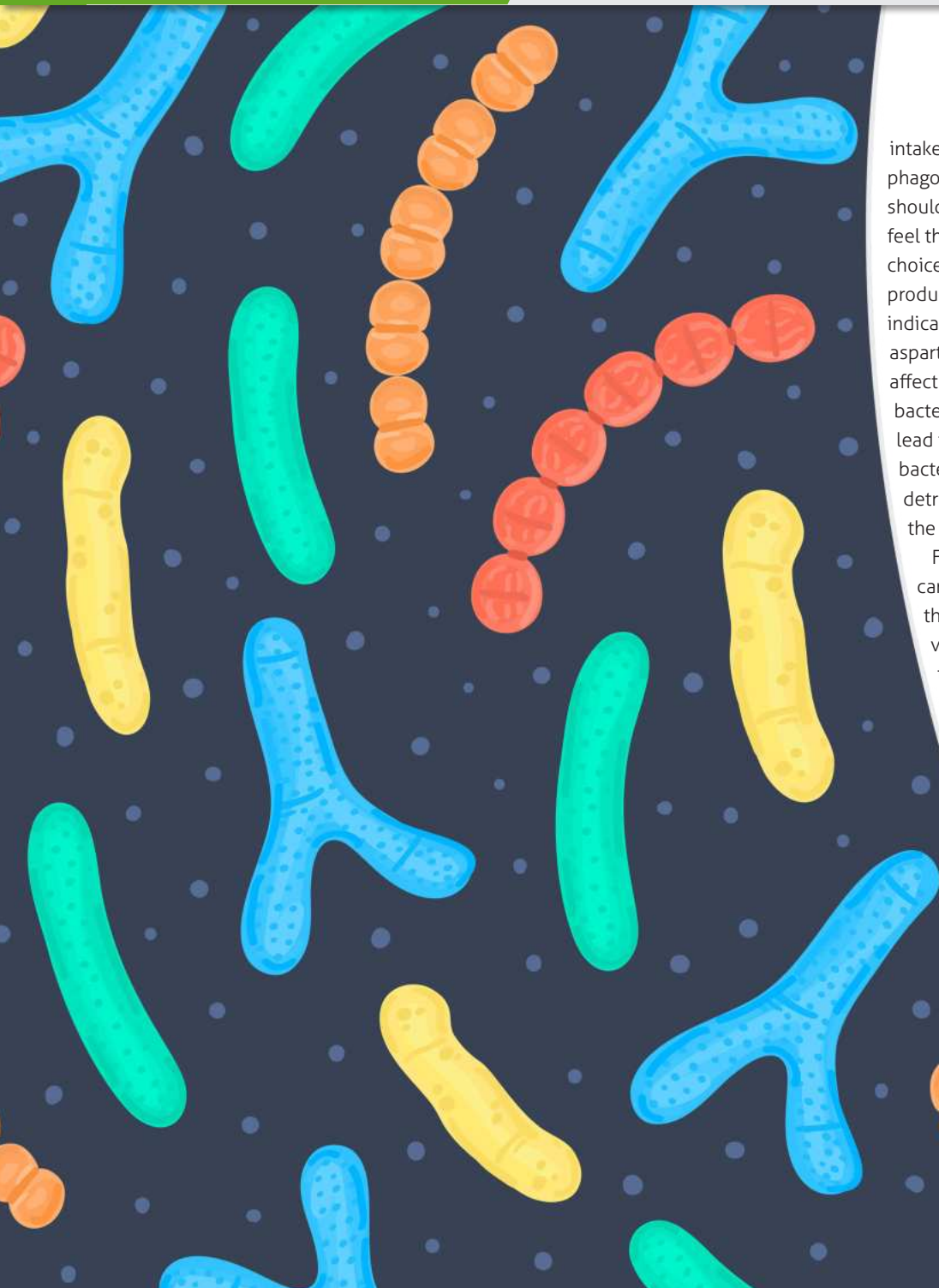
Braye added: "Nutrition is a critical determinant of immune responses and malnutrition is the most common cause of immunodeficiency worldwide.⁷ Low protein intake in particular is associated with a significant impairment of many immune cells and functions,⁷ so ensuring adequate intake from good quality sources such as organic grass-fed meat, wild fish, eggs, beans, legumes, nuts and seeds is therefore important.

"The late summer and autumn months are a time of abundance, where many fruits and vegetables are in season and tasting their best. In particular, from mid-summer onwards, encourage clients to pick local berries and fruits such as blackberries, raspberries, strawberries, gooseberries, elderberries and blackcurrants, which are rich in vitamin C and E and full of antioxidants to help build the immune system up before the winter months. Setting clients a '30 a week' rainbow challenge can be very effective for motivation."

She continued: "Certain varieties of mushrooms also appear to enhance innate and acquired disease resistance. The major immuno-modulating effects include mitogenicity and activation of immune effector cells.¹¹ Medicinal culinary varieties include oyster mushrooms, shiitake and button mushrooms, so I encourage clients to incorporate these into their diets on a daily basis. Green tea (*Camellia sinensis*), ginger (*Zingiber officinale*) and black cumin (*Nigella sativa*) also appear to have immuno-modulatory potential via various modes of action¹³."

Logan continued: "Strengthening the microbiome is vital, consuming fermented foods such as sauerkraut and kefir. It is important to limit the intake of simple carbohydrates, specifically, glucose, fructose, sucrose, honey and orange juice, as dietary





intake can significantly reduce phagocytosis.⁽³⁾ Artificial sweeteners should also be avoided. Many people feel they are making the 'healthy choice' by avoiding no added sugar products. However, studies have indicated that including acesulfame, aspartame and saccharine will affect the numbers and types of bacteria in the microbiome and can lead to a reduction in beneficial bacteria, which, in turn, have a detrimental effect on the health of the immune system^{(4-6).}

Földi continued: "A balanced diet can help give the immune system the energy it needs to fight off viral attacks. It is recommended to get at least five portions of fresh fruit and veg at this time of year, since these are the foods that contain the nutrients your immune system needs to be as strong as possible. It is generally agreed that eating warm, cooked foods suits most people in the winter months. These are easier on the digestive system. Adding some

fermented foods can be helpful if the person finds they suit their system and, of course, eat more mushrooms."

And Shaw recommended: "In Chinese medicine, winter is a time of yin, so must be balanced with the warming foods of yang. Seasonal root vegetables like cabbage, carrots, sprouts, squash, sweet potatoes, beets and parsnips can all be a great way to add nutritious warmth to your meals. Including warming garlic in cooking can increase antibacterial and anti-viral activity. Where there is inflammation, there is oxidation, so using turmeric and ginger are great anti-inflammatory herbs to include in cooking, smoothies and stews."

And don't forget to feed the immune system, you must feed the gut. "It's a good idea to work on encouraging a healthy microbial balance in the gut (where over 70 per cent of immune cells reside),⁹ to support healthy immune and inflammatory responses. Traditionally fermented foods such as sauerkraut, kimchi, kefir, kombucha, miso and live yoghurt may help address dysbiosis in the gut,¹⁰ along with plenty of prebiotic rich fruit and vegetables, to help feed beneficial species," Braye advised.

Hutchinson agreed, adding: "Maintaining a healthy gut is paramount to a well-functioning immune system. About 80 per cent of immune cells reside in the gut, where they interact closely with the network of beneficial microbes, also known as the gut microbiome. Eat plenty of fruits and vegetables to nourish these beneficial bacteria. As mentioned, physical activity, stress reduction techniques and proper supplementation are also fundamental elements of maintaining a healthy microbiome."

SPECIFIC SUPPLEMENTS

Supplements are undoubtedly an important tool here and there's a vast amount you can build into a client programme.

Turning the focus to the gut, Braye advised: "As over 70 per cent of our immune cells reside in the lining of our guts and are supported by our beneficial gut bacteria,⁹ a good quality probiotic is a key supplement for those looking to support immunity. As different bacterial strains have individual beneficial effects and work in different areas of the gut, multi-strain products are believed to have

more positive benefits overall, supporting the immune system in a variety of ways.

"A 2014 systematic review found evidence from a number of good quality randomised controlled trials that the average duration of respiratory illness episodes, the number of days of illness per person and the number of days absent from day care/ work/school are significantly reduced with probiotic treatment compared with placebo¹⁵."

Hutchinson went on: "Supporting gut mucosa may improve the condition of the sinuses and nasal passages too, through what is known as the common mucosal system. This system allows distant mucosal surfaces to interact, producing secondary immune when an antigen is presented elsewhere in the body. It is difficult for the body to achieve its best state of health and ward off illness unless the gut is in good condition, so the best place to start with boosting the immune system is with supporting (and in many cases repairing) the gut."

And Logan added: "A study carried out in the UK and Sweden checked people's oral and gut biomes directly after a one-week course of antibiotics. They then checked the same people at one, two, four and 12 months post treatment. Generally, whilst the oral microbiome recovered quite quickly, some of the bacteria in the gut suffered a crushing blow. This indicates the importance of using a good bacteria supplement during and after antibiotics.

(10) Strains which could be particularly important will include:

- *Lactobacillus acidophilus* and *Lactobacillus casei* – both these strains increase lactic acid production and encourage the growth of other, beneficial bacteria.⁽¹¹⁾

- *Bifidobacterium bifidus* – although found mostly in the gastrointestinal tract, this bacterium is also found in the mouth, vagina and in breast milk. It plays a role in building up the immune system, lowering cholesterol levels, and reducing the chance of allergies and intolerance.⁽¹²⁾

- *Lactobacillus reuteri* – a bacteria which needs to be taken in a supplement, *L. reuteri* has been shown to help support and strengthen the immune response⁽¹³⁾."

She also turned her attention to beta glucans, explaining: "Beta glucans are one of the most researched ways of reducing the number and severity of infections. A study was carried out on marathon runners, giving them either beta glucan or placebo over four weeks post-marathon. The number of URTIs in the beta glucan group was eight per cent, whilst that in the placebo group was 24 per cent⁽⁷⁾. A further study involved 162 patients of all ages (18-70) who had suffered cold infections at least three times in the previous six months. As well as 25 per cent fewer infections in the beta glucan group, the severity of infections was reduced.

(8) Another report followed 100 subjects, receiving either beta glucans or a placebo over 26 weeks. There were significantly more

"A 2014 systematic review found evidence from a number of good quality randomised controlled trials that the average duration of respiratory illness episodes, the number of days of illness per person and the number of days absent from day care/ work/school are significantly reduced with probiotic treatment compared with placebo"

subjects with common cold symptoms in the placebo group and it was noted that beta glucans significantly reduced the severity of the typical cold symptoms⁽⁹⁾."

Logan added that the source is important, and the best to recommend is those from yeast or fungi and to consist of a^(1,3)-beta-linked backbone with small numbers of^(1,6)-beta-linked side chains.

Brown added: "From a personalised perspective, supporting healthy resistance to infection could consider a few things that may or may not be important for different people and include optimising intake/status of nutrients that play a key role in immunological defence such as vitamin A, C and D, as well as

selenium and zinc. Beyond those foundations, preventatives that prime the immune system have shown benefit in some clinical trials, such as elderberry (300-600mg of extract, or 15ml syrup/ daily), yeast or mushroom-derived beta-glucans (250-500mg/day) garlic extract (180mg/day) or n-acetylcysteine (600mg/day).

"In addition, stress can suppress immune function and, in my experience, plays an important role in determining resistance to infection. Therefore, mind-body medicine such as meditation, yoga or simple relaxation strategies can help. Support with adaptogens such as ashwagandha (500mg/once daily) or rhodiola (200-400 mg/once daily) may also be useful."

Meanwhile, Braye suggested: "Zinc also affects cells involved in both innate and adaptive immunity at the survival, proliferation and maturation levels.¹⁷ While acute zinc deficiency causes a decrease in innate and adaptive immunity, chronic deficiency increases inflammation.¹⁷ An ongoing trial among NHS family doctors, due to report later this year, is also testing the medicinal herb, andrographis, to see if both patients and doctors regard it as an acceptable alternative to antibiotics in an attempt to combat antibiotic resistance. Previous systematic reviews have concluded that andrographis is superior to placebo in alleviating the subjective symptoms of upper respiratory tract infections and there is preliminary evidence of a preventative effect¹⁸."

Födi highlighted medicinal mushrooms.

"Dietary supplements based on medicinal mushrooms are a powerful arsenal that help enhance the immune system and can be taken during the whole year. Multiple clinical trials have demonstrated the powerful healing properties of these natural wonders, mainly attributed to their rich content of active immune modulatory compounds, in particular, beta-glucans, glycoproteins and triterpenes. So, they have the ability to modulate a person's immune system and restore balance, protecting the body from a large variety of disease and health issues," he explained.

"Studies with medicinal mushrooms have shown that favourable activity on the immune system occurs more actively when different fungi are combined, since each of them stimulate

the immune system, strengthening the defences and helping to support our immune defence against possible pathogens (viruses, bacteria)."

Looking specifically at those that can help, Födi recommended a synergistic mixture of five well-known medicinal mushroom extracts, such as reishi, maitake, shiitake, cordyceps and *Agaricus blazei*, murrill. Reishi extract can be used for overall general good health. It has effects like those of cortisone and so it can be used for all kinds of physical inflammation, which plays a central role in all chronic illnesses."

THE NEED FOR VITAMIN D

It is one of the most important nutrients for many functions, including for the immune system, yet it's clear the nation's levels are lacking.

Berry explained: "Vitamin D is now the most researched of all nutrients and deficiency has been directly linked to a number of auto-immune diseases, such as multiple sclerosis and diabetes. A poorly functioning immune system may be exacerbated by low vitamin D levels and may leave you susceptible to issues such as these, so it's important to maintain optimal levels of this vitamin year-round.

Sharpe continued: "As vitamin D deficiency can be related to other symptoms too then taking steps to ensure adequate vitamin D status should be a year round concern. Levels are usually highest after the high sun exposure during the summer months, but this doesn't necessarily mean that a person has adequate levels. Bad weather, along with seeking shade and using sun creams, means that even when people are out and about, they may not get adequate exposure. Just be sure to double check dosage suggestions for restoring adequate levels, as well as healthy maintenance as these can differ, as well as the length of time you should take it for."

In terms of vitamin D supplementation, Berry suggested: "Only 10 per cent of our vitamin D comes from food and studies have shown that vitamin D is crucial in activating the body's immune

defences. Without sufficient intake, the killer cells of the immune system – the T cells – will not be able to react and fight off serious infections within the body. For this reason, I would recommend that people test their levels of this vital vitamin. It's important to understand baseline vitamin D levels to determine how much supplementation is required.

"As a rule of thumb, I suggest that intakes of around 1000 IU of vitamin D for every 25kg of body weight to maintain a healthy level. So, for an adult, we would be looking at 2000 to 3000 IU daily.



A LIFESTYLE PLAN

Supporting immunity requires a healthy diet but there is much more to it than that.

"It might sound obvious but one of the best ways to support the immune system to shake off a cold is to rest. When we aren't running around using up energy and being exposed to further things for the immune system to deal with, our body is better able to turn its attention to fighting the infection at hand," Bray explained.

And Berry advised: "One of the easiest ways to ward off winter bugs is by practicing good hygiene. Wash your hands frequently, disinfect household objects and avoid people who are sick. It's also important to manage stress as this can impact the effectiveness of the immune system, reducing its ability to fight off antigens. The stress hormone, corticosteroid, can suppress immune system efficiency, so taking steps such as yoga, massages and pursuing hobbies to reduce daily stressors is likely to positively impact immune response.

"It's also important to maintain a consistent sleep routine, by going to bed and waking up at the same time each day. This will help to optimise sleep quality and allow the body to reset, fighting off any potential 'germs' you may have picked up throughout the day.

"Regular exercise will not only help to control weight gain, but it will also help to boost the immune system. Helping to strengthen the body, while releasing endorphins to reduce stress levels, exercise keeps the body healthy, however, it can contribute towards a weakened immune system if undertaken in excess. Therefore, those who succumb to infection regularly should exercise in moderation, with regular rest breaks and at a suitable intensity."



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¹published 2014 in the British Journal of Nutrition

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¹Journal of Appetite, 2012: the Alpro Foundation awarded results in obesity

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Mushroom extracts: The future of science-based immunomodulation

Discover how mushroom nutrition works synergistically with many body systems.

In conventional medicine, autoimmune and inflammatory conditions are often simply treated with medication that suppresses symptoms or the reactions of the immune system. Immunosuppressive and anti-inflammatory medications, in particular, are known to have adverse effects, including (in the case of immunosuppressants) leaving the patient more open to infection.

Nutritional and functional practitioners take a more systematic approach to immune and inflammatory conditions, aiming to determine and address underlying imbalances that may be contributing to the condition in that individual. As well as recommending dietary and lifestyle changes, many practitioners will incorporate supplements or botanical extracts into their clients' plans, which may help to naturally reduce inflammation or regulate the immune response.

MEDICINAL MUSHROOMS

Medicinal mushrooms are biological response modifiers (BRMs), which means that they work synergistically with many body systems. They offer powerful, wide ranging benefits, which include acting as immune modulators, improving immune defence against tumour cells (CD4, CD8, NK cells), reducing inflammation, increasing capacity for physical activity and energy, improving tolerance to treatments and/or decreasing adverse side effects, as well as promoting a positive emotional state.

If we look at modern medicine, at least 40 per cent of western medicines have some relationship or derivation from mushrooms; two of the most recognised pharmaceutical drugs originate from the mushroom kingdom, penicillin and statins. In Japan, polysaccharides extracted from the *Coriolus spp.* mushroom (specifically PSK/PSP extracts) have been approved as an integrative therapy for digestive cancers in the public healthcare system since 1984.

BIOACTIVE COMPOUNDS

Substances such as beta-glucans, hericenones, triterpenes, lentinan, ganoderic acids, etc., may not be familiar to the general public, but they become more popular everyday amongst the scientific community due to their lipid-lowering, immunomodulatory, anti-tumour, antioxidant, hepatoprotective and other beneficial effects.

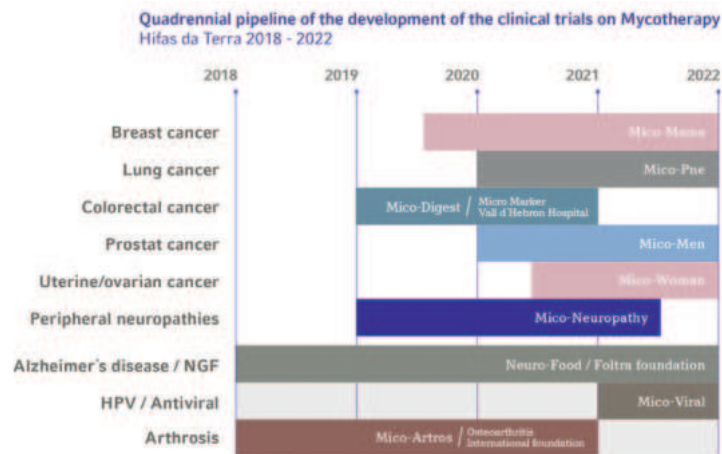
In the last 10 years, Pubmed, a key online portal for scientific



articles, listed approximately 1,000 articles on reishi alone, which reflects the growing interest in the medical uses of fungi.

MUSHROOM BIOSCIENCE

Hifas da Terra, a biotechnology company that researches and produces certified organic medicinal mushrooms, has spent many



MUSHROOMS CAN HELP YOU

Mushrooms have great potential to help those with a cancer diagnosis. The nutritional deficiencies associated with cancer are complex, but we know that improving nutritional status can improve the immune response and, therefore, reduce the risk of opportunistic infections and other side effects. This is one use of mushrooms in the complementary support of cancer, but it is by no means the only use.

In addition to being an excellent nutritional supplement, multiple studies confirm the effectiveness of adjunctive use of mushrooms to enhance the outcomes of chemotherapy and radiotherapy, whilst also reducing pain and other side effects of conventional treatment (loss of hair and appetite, vomiting, etc.). There is also evidence that mushrooms modulate the immune response and, thanks to one of Hifas da Terra's research and development projects, the company has demonstrated the anticancer activity of some of its mushroom extracts in specific tumour cell lines.

The evidence of the therapeutic uses of fungi is continually growing and forms the basis of further scientific research. Based on current evidence, we know that fungi can:

- Reduce the side effects of chemotherapy and radiotherapy treatments.
- Improve the response to chemotherapy and radiotherapy treatments.
- Improve the emotional state by increasing hours of sleep and reducing stress levels.
- Help to modulate the immune system by increasing specific immune cells.
- Support the process of programmed cell death (apoptosis) and help to stop both the growth of abnormal cells and the formation of new blood vessels, which allow tumour growth and expansion (angiogenesis).
- Compromise the viability of tumour cells via cytotoxic activity.

years researching medicinal mushroom strains in order to isolate and cultivate those with the highest quality and quantity of active ingredients.

Through ongoing research, Hifas da Terra is continuously demonstrating the low risk of drug interactions with its products, as well as building scientific evidence of the potent benefits of medicinal mushrooms, not only as part of cancer treatment, but also for a wide variety of other complaints and diseases. This paves the way for the use of mycotherapy (the therapeutic use of mushrooms) as a key branch of integrative medicine, and a powerful adjunct to treating one of the most significant health challenges of the 21st century.

EXCELLENCE IS THE KEY

Hifas da Terra's food supplements are made using only the highest quality organic mushrooms, which are grown naturally in the ancient chestnut forests of Galicia, in northern Spain.

The Micosalud range of products are highly concentrated extracts of bioactive mushroom constituents, either from individual mushrooms or in synergistic combinations. The company invests in extensive research and development programmes, working with medical researchers, biochemists and other health professionals in order to develop innovative, top-of-the-range mycotherapy supplements.

Research projects at Hifas da Terra

■ **FungiTechOnco:** Hifas da Terra has identified the anti-tumour activity of certain fungal extracts on specific cancer cell lines. This study also indicates that extracts rich in polysaccharides inhibit the migration and invasion capacity of tumour cells into other tissues, thereby impacting the cellular changes identified as part of the metastatic process.

■ **Micromarker (Mico-Digest):** This project, carried out in collaboration with the Vall d'Hebron Hospital, in Barcelona, is evaluating the relationship between the modulation of the intestinal microbiota and the progression of colorectal cancer with the Mico-Digest product.

■ **Neurofood:** A clinical trial focused on developing functional foods which can mitigate cognitive deterioration in humans. The evidence includes an exploration of the impact of the alpha-linolenic acid, vitamin D and vitamin B12 compounds present in lion's mane, shiitake and reishi, all of which have shown positive effects in neurological diseases.

■ **Mico-Dol:** This was a recently concluded biotech clinical trial undertaken in collaboration with the Osteoarthritis Foundation International (OAFI), which assessed the impact of taking fungal extracts in patients with osteoarthritis. A sample of 20 patients participated over three months. Following adjunctive intake of a Mico-Five protocol alongside conventional pharmaceutical treatment, there was a generalised average pain improvement of around 24 per cent, with a maximum of up to 40 per cent. On a VAS scale (Visual Analogue Scale), patients reported perceived pain reduction from seven to four, and six to two, which, according to Dr Möller, the head of the project, represents a significant perceived improvement.

■ **For further information please visit:**
www.hifasdaterra.co.uk

The future of healthy food on the menu at Food Matters Live 2019



19-20 November
ExCeL, London
foodmatterslive.com

Food Matters Live 2019 is back with a focus on healthy and nutritious new ingredients, clean-label products, and nutraceuticals.

Be the first to discover the latest natural and organic ingredients on the market as challenger and mainstream brands showcase their new innovative products at the largest gathering of producers in the UK.

Food Matters Live is being held at ExCeL London on November 19-20, where nutritional professionals can experience first-hand an exhibition of exciting ingredients, which have been developed to improve cognitive, digestive and immune health, promote healthy ageing, and reduce salt, sugar, and fat content in our food and drink.

An exciting new range of nutraceutical developments will also be introduced at Food Matters Live 2019, being an essential stop for nutrition professionals. The Nutraceutical Showcase is supported by the UK Council for Responsible Nutrition and highlights some of the most innovative new supplements and nutraceuticals on the market in terms of health claims, functional ingredients, sustainability, efficacy, bioavailability and delivery mechanisms.

EDUCATIONAL LESSONS

Visitors to Food Matters Live can also see some of these exciting healthy, natural and sustainable products in action in the Innovative Ingredients Live theatre, where nutritional experts will demonstrate the science behind new and emerging ingredients, including the fibre-rich products designed to promote healthier ageing, take a fresh look at chickpeas, and the latest sugar reduction solutions.



Furthermore, there will also be an impressive line-up of industry innovators and chefs exploring the nutritional benefits of culinary cultures from around the globe during the International Innovations live theatre experience. From the dietary benefits of Peruvian superfoods, the secrets of the Mediterranean diet to Japanese inspired ingredients, there is something for everyone interested in nutrition and healthy foods.

Visitors will also find plenty of food for thought in our

renowned seminar programme as industry innovators, policymakers and campaigners take a fresh look at the challenges and issues facing dietician and nutritionists in the future.

Speakers confirmed so far include Elsa Bernadotte, Karma Founder and COO, DEFRA's UK Food Surplus and Waste Champion, Ben Elliot, and Heather Mills, founder of plant-based food company, Vbites.

■ You can register at www.foodmatterslive.com/2019



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THE ANTIOXIDANT EFFECT

Our experts discuss the critical role of antioxidants in maintaining health to counter the effects of modern living.

The 21st century lifestyle that we live in these days is placing increasing amounts of pressure on our bodies, thanks in part to the plethora of toxins – both avoidable and unavoidable – that we are exposed to these days. Our ever-increasing toxic load is creating huge challenges in the body, which has to work overtime to cope with the effects.

What we do know is antioxidants are a critical component of dealing with these toxins and lessening the effects on our health. But, given most people are not meeting the recommended five a day fruit and veg intake (perhaps the simplest way to obtain antioxidants), as well as the fact many Brits miss out on adequate levels of key nutrients, the nation has a long way to go to be meeting its nutritional needs.

Roma Bansil, Naturopath and Nutritional Therapist BSc (Hons), ND, N.T. Dip, rCNHC, mBANT, Clinical Nutrition Advisor at BioCare, advised: "These days and more than ever, it has become difficult to avoid exposure to a variety of harmful toxins via the air we breathe, chemical based cleaners and cosmetics via our skin, or the food and drink we ingest on a daily basis.^{1,2,3} Stress also plays its role in suppressing immunity and increasing toxic burden.

"The ability to quench the resultant free radicals may be reduced if there

is a low antioxidant diet and low activity of necessary antioxidant enzymes, superoxide dismutase (SOD), catalase (CAT) and glutathione (GSH), due to genetic polymorphisms or nutrient deficiencies. Hence, subjecting us to the pro-inflammatory effects of free radicals."

Dr Elisabeth Philipps PhD BSc Hons BSc Nutr Med, Neuroscientist and Nutritional Therapist at Nutrigold, continued: "Antioxidants are our defence against free radical damage and are critical for slowing down both the internal symptoms of ageing (such as cardiovascular disease), as well as the external signs of ageing (such as skin wrinkles). At high concentrations, ROS and other free radicals can overwhelm the body's natural antioxidant systems, compromising the important enzyme superoxide dismutase (SOD) and depleting the 'master antioxidant' glutathione. This results in something called oxidative stress, a deleterious process that damages cellular structure and function.

"Oxidative stress has been implicated in ageing and poor health, as well as in the development of chronic and degenerative conditions such as cancer, arthritis, autoimmune disorders, cardiovascular diseases, and neurodegenerative conditions."



DEFINE AN ANTIOXIDANT

So, what would the experts say constitutes an antioxidant and, more importantly, what are the richest sources of these?

Bansil explained: "Antioxidants can be man-made or natural substances that reverse or stop the process of oxidation from happening. In science, oxidation is the gain of oxygen by a substance, meaning it has become oxidised. To give some common examples of everyday oxidation, think of a freshly cut apple or avocado turning brown, a nail becoming rusty or a copper statue turning green.

"In most instances, the process of oxidation causes damage or destruction. Interestingly, this very process of oxidation is happening within us all the time and is a very natural and essential part of our biochemistry. Oxidation through the chain of reactions of free radicals forms the basis for the body's ability to metabolise air and food into chemical energy. Free radicals are unstable and highly reactive and will search the body to become stable again, in doing this they cause damage to cells, proteins and DNA, known as oxidative stress, which, in turn, can trigger several chronic diseases.

"When free radicals build up too much, they can start to cause harm. This is where antioxidants come into play. The balance between free radicals and antioxidants is imperative for proper physiological function. Antioxidants can safely react with these free radicals, quenching their need to be balanced, therefore, preventing them from causing any damage to the healthy cells in the body. They do this by either donating an electron or accepting an electron."

And Dr Philipps went on: "Antioxidants are substances that can prevent or slow damage to cells caused by free radicals, unstable molecules that the body produces as a reaction to environmental and other pressures. They are sometimes called free radical scavengers. Oxygen is an element indispensable for life; without it, the mitochondria in our cells cannot produce energy (ATP). Oxygen, however, is a highly reactive atom, and thus emits a kind of car exhaust as a natural by-product of its reactive metabolic processes. This car exhaust is known as reactive oxygen species or ROS, a type of free radical (all ROS' are free radicals, but not all free radicals are derived from oxygen).

"The term reactive means that these forms of oxygen can react with (bind to) proteins, lipids, and/or DNA, causing them to become oxidised. Excessive oxidation can cause permanent damage to cell structure and function, eventually leading to cell death. At certain levels, these free radicals damage healthy cell membranes and important organelles inside the cells, such as the nucleus and mitochondria, thus speeding up the ageing process."

ANTIOXIDANT ACTION

So, we know what antioxidants are, but how do they work and what functions do they perform?

"In order to shield us from these potentially damaging substances, our body must act to protect our cells. It can do this by deploying antioxidants, therefore, shielding us against the impacts of ageing, reducing the virulence of chronic disease, improving cognition and mental health and maintaining and improving general wellness," Bansil advised.

"Dietary antioxidants work alongside the antioxidant enzymes, SOD, CAT and GSH to support neutralisation of reactive oxygen species (ROS) generated from exposure to environmental factors and our own metabolism. By helping to prevent oxidative damage, of DNA, cell membranes and proteins, they help to conserve the integrity and function of cells and tissues."

And where can the richest sources be found?

"Dietary sources of antioxidants are the cheapest, most natural and ideal way to keep on top of the antioxidant needs of the body. A diet abundant in a variety of coloured fruits and vegetables can provide an abundance of antioxidant nutrients required by the body. These mainly include the vitamins A, C and E, and the minerals, copper, zinc and selenium," Bansil advised. "Other dietary food compounds, such as the phytochemicals in plants, are believed to have greater antioxidant effects than vitamins or minerals. These are called the non-nutrient antioxidants and include phytochemicals, such as lycopene in tomatoes and anthocyanins found in cranberries.

"Humans also maintain complex systems of multiple types of antioxidants, which include glutathione, vitamin C, vitamin A, and vitamin E, as well as enzymes such as catalase, superoxide dismutase and various peroxides. Those individuals with increased requirements due to compromised health or a high exposure to toxins or inflammation, can benefit hugely from the use of supplements to provide extra support."

ADDRESSING LOW LEVELS

There are various factors – many of them lifestyle

– that can cause a person to have too low levels of antioxidants.

“Early detection may not be obvious but external signs may include ageing skin and then development of chronic non-communicable diseases, such as cardiovascular disease and arthritis,” Dr Philipps advised.

Bensil added: “Antioxidants are abundant in nature and the nutritional content of natural whole foods is exactly what our body needs to negate the effects of everyday physiological processes. However, with diets nowadays being deficient in nutrients – where urbanisation, overuse of agricultural land, intensive farming, stress-fuelled society and there being easy access to processed foods – we have become unable to provide our body with the essential nutrients required to neutralise this free radical activity. On top of this, the following factors can add an extra burden on the free radical-antioxidant balance that the body endeavours to achieve:

- Smoking.
- Pollution; ozone, certain pesticides and cleaners, radiation.
- Drugs; some prescription and illegal.
- Stress.
- UV light.
- Processed foods; sugar, trans fats, alcohol.”

She continued: “Single nucleotide polymorphisms (SNPs) can also cause an additional burden through compromising the body’s ability to deal with the toxicity generated from the above factors, therefore, tipping the balance further. In addition, physiological stress or specifically chronic diseases can be a substantial indicator of low antioxidant status. The constant need for the body to maintain homeostasis will be high in these situations and, therefore, there is a potential for greater antioxidant use.

“Intestinal permeability can also create a situation where food particles, toxins, drugs and pathogens move through the leaky junctions of the endothelial gut barrier into the bloodstream, causing a raft of immune reactions, leading to systemic inflammation and hence the additional need for the mopping of free radicals in the body.”

It’s important to know the signs if a person is lacking in antioxidants, with Bensil advising: “Since free radical damage can affect so many different systems of the body, the signs and symptoms of low antioxidant status can be varied.

- Low immunity and inability to fight infections off, constant acute infections.
- Fatigue.
- Early ageing.
- Aching or stiff joints could be indicative of systemic inflammation.
- Chronic disease, especially cardiovascular disease, chronic fatigue syndrome etc.”

A RICH DIETARY PLAN

So, what do the experts recommend to ensure we have enough?

“Science has shown that we can protect ourselves from oxidative stress and reduce the ageing process through lifestyle choices, such as reducing refined sugar in the diet, reducing exposure to environmental toxins, managing stress, taking antioxidant supplements, and increasing our daily intake of fruits and vegetables,” Dr Philipps advised.

“Plant-based foods are rich in nutrients such as zinc and magnesium required for glutathione and SOD production. Fruits and vegetables also contain a range of different antioxidants and phytonutrients, like:

- Carotenoids like lutein and zeaxanthin, found in yellow and green vegetables, carotenoids offer



protection to the eyes, reducing the ageing of retinal tissue in conditions like macular degeneration

- Flavonoids, such as the quercetin found in onions and apples, with their immune boosting effects
- Polyphenols, such as those found in green tea and grape seed, which offer anti-ageing benefits.

“Many fruits and vegetables are also high in vitamin C and vitamin E, offering yet more forms of antioxidant protection to the cells. In fact, studies show that vegetarian and vegan diets reduce the incidence of diseases linked to oxidative stress, likely due to their richness in antioxidants. Research published in the *Journal of Agricultural and Food Chemistry* has shown how the antioxidant compounds found in lettuce leaves work at different speeds in the body, offering cellular protection over various timescales. (Pham-Huy LA, et al. Free radicals, antioxidants in disease and health. *Int J Biomed Sci*. 2008 Jun;4(2):89-96.)”

Bensil added: “With a good antioxidant dietary plan, we want to ensure we are eating foods that are

naturally high in antioxidants but also avoiding foods that will consume or use up or antioxidants pools. In the mornings, eating brightly coloured breakfast bowls and salads, made using a variety of fruits and vegetables are an ideal way to provide an abundance of natural food-based sources of antioxidant nutrients.

"Generally aiming for eight to 10 portions of vegetables and fruit daily not only to provide a rich source of vitamins, minerals and fibre, but also for their rich and colourful plant pigments, with the ability to serve as antioxidants providing cellular defence. Here is an overview of the key oxidant types and which food types we can find these in:

- **Vitamin C:** Not only supports our immune cells,⁶ it may reduce tiredness and fatigue, acting as a cofactor for iron absorption and also supporting collagen formation for healthy joints and skin.⁷
- **Selenium naturally found in Brazil nuts:** Is a critical component of antioxidant enzymes, and also supports the production of glutathione, which is the most potent and versatile antioxidant produced in the body.
- **Zinc, especially red meat, turkey, oysters, pulses, lentils, nuts, and seeds, such as pumpkin seeds:** An antioxidant mineral naturally abundant in animal protein, it is important for the functioning of over 300 enzymes, contributes to normal DNA synthesis and underlies the physiology of every body system.⁸
- **Flavonoids found in rosehip, bilberry and other berries:** Also rich in vitamin C, have been shown to support circulation and strengthen capillaries.⁹
- **Quercetin:** Quercetin is a flavonoid found in many fruit and vegetables, such as onions, apples and citrus fruits. It inhibits inflammation¹⁰ and antigen-stimulated histamine release.¹¹ It has also been associated with the protection of DNA from oxidative damage.¹² It induces apoptosis (programmed cell death) in cancer cells. One of the most potent

antioxidants that is used often by nutritionists to support normal histamine release and support an overactive immune system

- **Lycopene naturally found in tomatoes, spinach, kale, strawberries and cherries:** Has been shown to contribute to prostate health¹³ and, alongside other carotenoids, protect the skin from damage.¹⁴
 - **Rutin and hesperidin naturally found in citrus fruit:** Have been shown to support cardiovascular function and reduce inflammation.¹⁵
 - **Polyphenols found in green tea:** Have been shown to counteract UV-induced inflammation in the skin¹⁶.
- In terms of helping clients incorporate antioxidant-rich foods, Dr Philipps suggested:
- "Use more varieties of vegetables that you usually would. For example, when cooking a casserole with onions and carrots, add in some fennel, tomatoes, and squash or sweet potato.
 - Shred your veg; use a food processor or mandolin to finely slice different coloured cabbages, onions, and carrots to make a tasty homemade slaw. Smaller pieces of vegetables are easier to digest, and you can eat more of them!
 - Make a smoothie. Throw in a handful of spinach, a small banana, half an avocado, and a handful of frozen blueberries into a blender with some almond milk to pack a big dose of fruits and vegetables into one easy breakfast smoothie. Add one date to make it sweeter, if desired.
 - Substitute vegetables for carbs, such as zucchini noodles instead of pasta, or cauliflower rice instead of white rice.
 - Use leftover vegetables in a soup by simply boiling them with stock and adding some lentils, beans, or chickpeas to make a nutritious and tasty lunch. Making soups also reduces food waste!



IN SUPPLEMENT FORM

As Nutritional Therapists, you will no doubt see many clients who aren't eating adequate amounts of foods containing antioxidants, and so there is a clear education message that is needed in terms of the need to support the diet with supplementation.

Dr Philipps recommended: "A combination of plant phytonutrients, such as green tea extract and resveratrol, plus minerals including selenium and zinc, glutathione, coenzyme Q10, astaxanthin and melatonin – antioxidants work in different ways, in different parts of the body and at different speeds so a combination through diet and supplements will ensure coverage.

"Melatonin is not traditionally considered an antioxidant but not only has antioxidant properties of its own, it also stimulates the body's production of other antioxidants, namely glutathione peroxidase (GPx), superoxide dismutases (SOD), and catalase – both under normal circumstances and under conditions of elevated oxidative stress. Melatonin has also been shown to regulate the expression of several genes pertaining to antioxidant function, in part by upregulating the Nrf2 cell-signalling pathway.

Nrf2 regulates various genes related to antioxidant production, detoxification, and cell survival, and has even been called the master regulator of the body's antioxidant response.^{1,2,3}

"However, it's important to remember, as harmful as ROS can be, they can also protect us. For instance, our white blood cells rely on ROS to fight off bacterial invasion as well as to attack cancer cells.⁴ Quenching all of the free radicals in the body would therefore be detrimental to our health. Context is important, and melatonin has demonstrated its ability to be context-specific."

For Frankie Brogan, Senior Nutritionist at Pharma Nord, selenium should be a key consideration.

"Though multiple antioxidants can be obtained from the diet, several important antioxidants are made in the body. Glutathione is a perfect example, though adequate selenium from food or supplements is still needed for its production," he explained.

"I would always recommend selenium-yeast for an antioxidant boost. While other antioxidants such as vitamin C and E are important, selenium (via the selenoprotein, glutathione peroxidase) helps the body produce perhaps the most important antioxidant available to the human body – glutathione. Selenium-yeast products are organic, offering higher bioavailability than inorganic versions like selenate."

Bensil also highlighted grapeseed extract.

"It is an excellent source of oligomeric proanthocyanidins (OPCs). These antioxidant molecules have approximately 50 times more free radical scavenging ability than vitamins C and E. OPCs prevent collagen breakdown¹⁸ associated with ageing, and they bind to skin elastic fibres, preventing degradation of elastin by elastase.¹⁹ They also strengthen blood vessel connective tissue and capillaries^{20,21}," she explained.

She added that pine bark extract provides oligomeric proanthocyanidins (OPCs), which are thought to

be beneficial in supporting the immune²² and cardiovascular system.²³

"Green tea extract contains polyphenols. These are potent free radical scavengers. It supports metabolic health, significantly reducing body weight and circulating testosterone, oestradiol, leptin, insulin, glucose, cholesterol, and triglycerides.²⁴ Alpha lipoic acid can directly quench free radicals, also known as the 'master recycler' and can regenerate antioxidant vitamins E, C, and glutathione. This recycling property is one reason why antioxidants are widely considered to work optimally in combination rather than in isolation."

And Dr Philipps added: "A supplement known as N-acetylcysteine (NAC), which is metabolised to cysteine following absorption, can supply the cysteine required for the synthesis of GSH. NAC can thus often correct GSH depletion and reduce oxidative stress. NAC is not a powerful antioxidant in its own right; its strength lies in the replenishment of GSH in deficient cells, and it is thus likely to be ineffective in cells replete in GSH. The efficacy of NAC also depends on the activity of enzymes for the synthesis of GSH. NAC is therefore not effective in all cases."

THE LONG-TERM EFFECT

Prolonged exposure to toxins, and not countering this with enough antioxidants, can play a role not only in immediate health but also the long-term too.

Bensil pointed out that given it's known that antioxidants are important throughout the body, that explains why they can have such a knock-on effect to health.

"Through wide-ranging research in various disease areas, it has been understood that antioxidants have a role to play throughout the body, rather than in just a few disease areas. This alone tells us of the importance of keeping the balance between free radical production and antioxidant pools to mitigate this," she explained.



"Free radicals attack important macromolecules, leading to cell damage and homeostatic disruption. Targets of free radicals include all kinds of molecules in the body. Among them, lipids, nucleic acids, and proteins are the major targets.⁴ Proteins, lipids, and DNA make up a large part of our body, so that damage can lead to a vast number of diseases over time.

"Keeping this balance is becoming increasingly difficult today, with increased environmental exposures, higher stressful living and complex chronic disease. Most of us struggle to keep up with self-care in both a dietary and lifestyle sense. This is and will result in lower antioxidant pools within each of us, leading to various chronic diseases. These can include diabetes, atherosclerosis or the hardening of the blood vessels, inflammatory conditions, high blood pressure, heart disease, neurodegenerative diseases, such as Parkinson's and Alzheimer's, and ageing."

Bensil continued: "Cardiovascular disease is one of the areas that is on this rise, in part due to the peroxidation of blood lipoproteins, which is regarded as a key event in the development of atherosclerosis. This, in turn, can restrict blood flow, leading to hypertension and the plaques formed can then burst, triggering a blood clot, which, if not detected, can be very dangerous⁵."

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DEALING WITH DIABETES

Type 2 diabetes has become one of the most common 'modern day' chronic diseases and appears to be on the rise. But as a condition with so many modifiable factors, there is a real role that Nutritional Therapists can play and here, the experts discuss how.



We know that more people than ever before are suffering with diabetes, with the risk of type 2 being at its highest. Worryingly, according to Diabetes UK, if nothing changes, more than five million people will have diabetes in the UK by 2025.

Broken down between the two common forms, around 90 per cent of people with diabetes have type 2, around eight per cent have type 1 and about two per cent with diabetes have rarer types.

But given that type 2 is the most common form by far, and this is the form that responds incredibly well to changes in diet and lifestyle, there's a massive role for the nutritional therapy world to play in educating and supporting those at risk or already diagnosed.

"It is estimated that one in every 16 people in the UK now has diabetes, with global rates increasing from 108m in 1980 to 422m in 2014. The disease process behind type 2 diabetes is pretty clear; driven by a complex network of dietary and lifestyle factors, oxidative stress and genetics," commented Tracey Hanley, a Registered Nutritional Therapist at Cytoplan.

"Risk factors include being overweight or obese, physically inactive and having high blood pressure and cholesterol. On the other hand, the specific mechanisms driving type 1 diabetes are less well understood, however, genetics, an environmental trigger (for example, virus), increased intestinal permeability and immunity appear to play a significant role. There is increasing evidence that the composition of the gut microbiota plays a role in the development of both type 1 and type 2 diabetes.

TYPE 1 VS TYPE 2

Diabetes can sometimes be described as one condition, but it's important any clients with

concerns are made aware of the very real differences between type 1 and type 2.

Romina Melwani, Mycotherapist, Nutritional Therapist and Nutrition Advisor to Bio-Practica in the UK, explained: "Diabetes mellitus type 2 is a reversible condition, whereas diabetes type 1 is actually an auto-immune disease. Although both types are regarded as chronic diseases that affect the way the body regulates glucose and both can lead to complications, they display different mechanisms. Patients with diabetes type 1 are not capable of producing insulin as their immune system destroys the B cells in the pancreas that produce insulin, whereas those with type 2 don't respond as well to insulin as the cells in different parts of the body start to become resistant to insulin. Diabetes type 2 is more common and certainly on the rise."

Hanley added: "Type 1 or 'insulin-dependent' diabetes is an autoimmune condition, where the pancreas is attacked by antibodies, causing damage to the beta cells and inhibiting insulin production. Unlike type 1, type 2, or 'non-insulin dependent' diabetes, is not autoimmune in origin and occurs when the pancreas produces some insulin, but it is either not enough to meet the body's requirements or the body is insulin resistant and so cannot use it properly. This type of diabetes is far more prevalent, with type 2 accounting for 90 per cent of cases globally."

As already highlighted, while type 1 cannot be reversed, with type 2, the condition really is in our hands, with a whole list of modifiable elements.

Melwani added: "Diabetes type 2 can definitely be reversed with diet and lifestyle changes as we can see a decrease both in fasting plasma glucose (FPG) and glycated haemoglobin (HbA1c) in diabetes sufferers, with a reversion to pre-intervention values just with a change in their lifestyle and diet."



AT RISK GROUPS

There is no doubt that some people are more susceptible to developing type 2 diabetes and this is an important educational message.

Melwani advised: "Hormonal imbalances, excess food intake/ alcohol, as well as lack of exercise can be some of the causing factors for diabetes, although genetic factors, such as race and family history can also seem to be contributing factors, especially in diabetes type 1. Pregnant women who have developed gestational diabetes are more at risk of developing type 2 diabetes, as well as overweight people and woman with hormonal imbalances such as polycystic ovary syndrome (PCOS). PCOS is a condition that can definitely be linked to diabetes as it is associated to insulin resistance. In addition to regulating glucose metabolism, insulin is also known to affect fat and protein metabolism. This is why overweight people also are at risk of developing diabetes and metabolic syndrome."

Hanley continued: "Type 1 is more prevalent in people of Caucasian origin, while rates of

type 2 are higher than normal in people of South Asian, African-Caribbean or Black African descent. While traditionally a condition primarily seen in those over 40, rates of diabetes in children have skyrocketed in recent years. Furthermore, you are two to six times more likely to develop diabetes if you have a parent, sibling or child with the condition."

Keep in mind too that diabetes can be linked to other concerning health issues.

"High levels of blood glucose can cause organ damage over time and so there are several conditions linked to diabetes. Damage to the small and large blood vessels is common, and this can lead to heart issues, stroke, as well as damage to the eyes, kidneys, nerves and feet," Hanley explained.

"As high blood glucose is the driving factor underlying these complications, then working towards getting your diabetes under control is the best way of reducing your risk. If weight is currently an issue, then losing some of that weight can reduce insulin resistance and lessen your susceptibility to some of these risk factors."





CONDITION MANAGEMENT

In terms of strategies to reduce risk, there are some headline recommendations.

"Naturally, as a Nutritional Therapist, I recommend making big changes to diet and lifestyle. Increasing physical exercise, as well as adopting a plant-based diet, can dramatically change blood sugar levels. In terms of diet change, balancing pH levels is one powerful way to reduce the risk of diabetes by decreasing acidosis in blood pH. This can be carried out by reducing acidic foods and increasing alkaline foods," Melwani advised.

"Acidic foods such as meats and high protein foods trigger increased cortisol and an increased possibility of insulin resistance. Indeed, long-term exposure to a high acid load diet has been linked with insulin resistance and type 2 diabetes. This is why low acid foods (fruits and vegetables) are recommended. In terms of lifestyle, I would recommend bringing down stress levels as high cortisol has also shown a link to insulin resistance."

There will be differing pieces of advice if dealing with type 1 over type 2 diabetes, but there are some factors to bear in mind. Let's start with the dietary side of it.

Hanley advised: "In terms of diet, there are several key steps you can take to reduce your risk:

- **Nix the sugar:** We know that a high sugar and refined carbohydrate intake can quickly spike insulin levels and lead to insulin resistance and high blood sugar. Start by reducing the simple sugars in your diet, such as from soda, cakes, biscuits, honey and sugar. Once you are comfortable with that, move towards reducing the glycaemic load of the carbohydrates you consume i.e. choose starchy vegetables over white rice or pasta. Making 50 per cent of your plate non-starchy vegetables is a great way of instantly reducing your carbohydrate load, while still remaining satisfied.

- **Eat real (i.e. unprocessed) foods:** Refined and processed foods are confusing to the body as it was not designed to break down foods in this state. As such, a plethora of complications such as high blood sugar, inflammation and poor liver detoxification can be associated with a high intake of these foods. Instead, choose real, whole foods which promote a healthy metabolism. Approach your plate with the mindset of 'what would my ancestors recognise?' – in that sense, you'll find yourself focusing on fresh vegetables, legumes, nuts, seeds and fish.

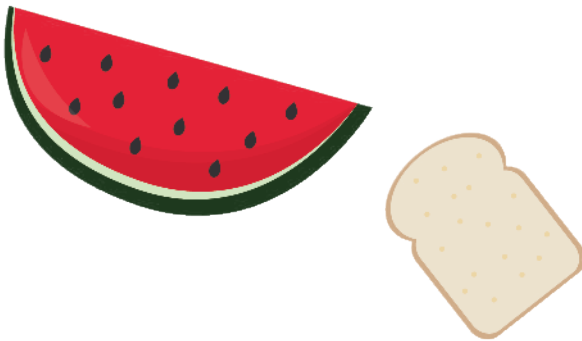
- **Get enough protein:** Obtaining 20-30 per cent of

your calories as protein is ideal for preventing and managing type 2 diabetes,¹ as it improves satiety, blood sugar levels and preserves lean muscle mass. Avoid the temptation to overdo it on the protein though, as too much can negatively impact your kidney health.

- **Stock up on fibre:** Not only can fibre fill you up, support healthy blood sugar and cholesterol levels, it also supports the bacteria in your gut. Good sources include legumes, nuts and seeds, green leafy vegetables, chicory, garlic, onions, asparagus, avocado and apples.

- **Don't be afraid of fat:** We know that it is not fat, but rather starchy carbohydrates, flour and sugar that are driving many of our health issues, including diabetes. With that said, there are healthy and unhealthy fats so make sure to eat plenty of nuts, seeds, avocado, extra virgin olive oil and oily fish, rather than refined oils, margarines and such. Adding some fat to each meal not only improves satiety, but it also slows down the rate at which carbohydrates are converted into sugar."

Hanley also highlighted that several studies have shown the benefits of intermittent fasting for individuals who are both overweight and diabetic, with participants experiencing weight loss and a drop



in haemoglobin A1c levels (the average level of blood glucose).^{7,8}

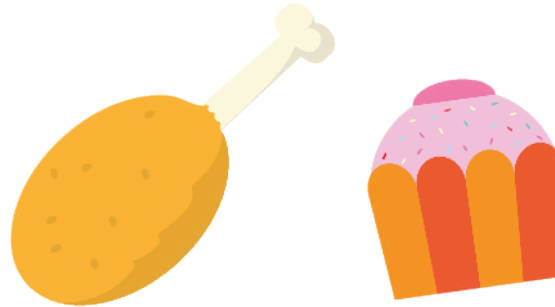
"There are several approaches to fasting and this should be done under the guidance of a registered health practitioner. In addition, portion sizes of starchy carbohydrate foods may need to be reduced further," she commented.

"Additionally, research has shown that metformin, a common medication given to diabetic patients, can negatively affect the gut microbiota. For this reason, it is wise to support these bacteria by increasing intake of prebiotic fibre, which has been shown to boost the blood sugar lowering effects of metformin.⁹ Similarly, supplementation with a *Lactobacilli* and *Bifidobacteria*-rich probiotic has been shown to reduce markers of inflammation and oxidative stress in people with type 2 diabetes^{10,11}."

A NUTRITIONAL PROGRAMME

Building in a nutritional programme that deals with supplementation too will be important.

In terms of what to recommend, Melwani advised: "When the person develops the condition, then an alkaline supplementation is recommended. In a recent randomised, placebo-controlled double-blind study, it was shown that an alkaline supplementation, improves the oxidative carbohydrate metabolism in the muscle and, therefore, has a positive effect on the energy metabolism of the cell. The increase



in glucose and insulin concentration following the test meal in the trial was also lower following four weeks' treatment with the alkaline supplement compared with the placebo. This positive effect was possibly caused by the increase in plasma magnesium concentration.

"Magnesium would also be a potent mineral showing insulin sensitivity improvement and metabolic control. Various papers have shown an insulin resistance reduction in prediabetes and diabetes. Magnesium is an essential enzyme cofactor in carbohydrate metabolism, and sensitises and regulates insulin receptor activity. Magnesium deficiency is linked to an increased incidence of diabetes and diabetic neuropathy and poor lipid management. Supplementation may improve glycaemic and metabolic control, lipid profile management, and mood in diabetic individuals.

"In a randomised, double-blind placebo-controlled trial, magnesium supplementation, at the dose of 650mg for 16 weeks, significantly decreased fasting blood sugar and HbA1c by 22 per cent and 21 per cent, respectively, compared to placebo. It is important, however, to choose the form of magnesium citrate in glucose management of overweight individuals. In a randomised crossover trial, 500mg of magnesium citrate per day for four weeks improved insulin and glucose homeostasis in overweight or obese individuals. Supplementation led to changes



in gene expression and proteomic profiling consistent with favourable effects on several metabolic pathways."

Hanley also recommended vitamin B12 (and folate), explaining: "Metformin, a commonly prescribed anti-diabetic medication, can deplete levels of B12 and folate, important nutrients for methylation and the mitigation of oxidative stress, in the long-term.¹⁵

"Low vitamin D levels are a risk factor for type 2 diabetes as this nutrient regulates inflammation and insulin sensitivity. Supplementation with vitamin D3 has been found to reduce inflammation and oxidative stress in those with diabetes.¹⁶ Alpha-lipoic acid is an antioxidant that alleviates oxidative stress, which is an underlying contributory factor of type 2 diabetes. As well as this, it can also enhance the uptake of glucose into cells and inhibit glycosylation (the attachment of sugar to proteins which impedes their functioning)¹⁷."

Hanley also recommended L-glutathione.

"Long-term high blood sugar is associated with reduced amounts of glutathione, which can lead to oxidative stress and tissue damage. Studies have shown that levels of glutathione are significantly lower in people with diabetes compared to healthy controls.¹⁸ And taking live bacteria supplements has been shown to improve insulin sensitivity, reduce fasting blood glucose and reduce HbA1c in patients with diabetes. However, the number of participants in studies is small and further evaluation is needed¹⁹."

BLOOD SUGAR CONTROL

A key component of managing diabetes is around blood sugar control and there are various considerations to make here.

From a supplementary perspective, Frankie Brogan, Senior Nutritionist at Pharma Nord, commented: "There are a few supplements that could be considered for blood glucose control. Chromium is a trace element which contributes to normal blood glucose management by making our cells more sensitive to insulin. Chromium-yeast products specifically offer higher bioavailability than their inorganic counterparts (such as picolinate).

"Other supplements to consider are natural extracts which have been shown to reduce the uptake of glucose after a meal. Delphinol, for example, (an extract of the chilean maqui berry) has been shown to partially inhibit the sodium-dependant symports of the small intestine, resulting in a more gradual blood sugar increase (and better control) after a meal."

Hanley added: "An active ingredient of a substance called GTF (Glucose Tolerance Factor). GTF stimulates the activity of enzymes involved in the metabolism of glucose for energy and the synthesis of fatty acids and cholesterol. When chromium levels are low in the body, GTF levels are low too and the activity of insulin is blocked – blood glucose levels therefore remain elevated. Studies show that people with type 2 diabetes have lower blood levels of chromium than those without the disease¹⁴."

A LIFESTYLE OVERHAUL

Of course, dietary changes need to be taken in partnership with some changes in lifestyle.

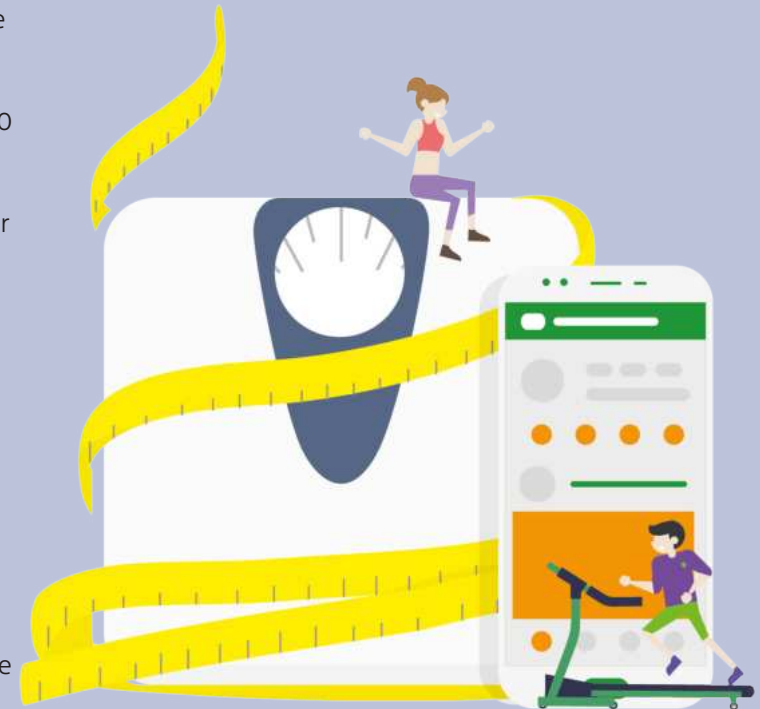
Hanley commented: "In terms of lifestyle, factors to consider include:

■ **Sleep:** Sleeping less than seven to eight hours per night is a significant risk factor for type 2 diabetes, as sleep loss appears to increase insulin resistance and affect energy metabolism, for example, levels of ghrelin, the hunger hormone, are increased after a poor night's sleep.² As well as this, good sleep hygiene is important to support a healthy circadian rhythm so avoid blue light at night, finish eating at least two to three hours before bedtime and sleep in a dark room to support melatonin production.

■ **Exercise:** there is a plethora of evidence to show the importance of regular exercise, both in preventing and managing diabetes, with a sedentary lifestyle being a significant risk factor for type 2 diabetes. In fact, just 30 minutes of walking daily can reduce your diabetes risk by approximately 50 per cent. Simply reducing your amount of 'sitting-time' by getting up from your desk or choosing to stand can improve blood sugar response post-meal.³

■ **Stress:** Stress has a marked effect on blood sugar levels. Continual or chronic activation of the body's stress response has been found to cause pancreatic beta cell dysfunction, which affects the body's ability to release insulin and can even encourage insulin resistance.⁴ Stress management is something we all need to consider, but if you are at risk of diabetes, this is even more important. Finding an activity that you find rejuvenating is key, however, if you need some inspiration, yoga, meditation and deep breathing techniques have been found to be particularly effective at decreasing fasting and post-meal glucose levels.⁵

■ **Exposure to toxins:** While toxic accumulation has been traditionally associated with conditions of toxicity, such as allergies and cancer, recent studies have shown that persistent exposure may cause damage to pancreatic beta cells and thus impair insulin secretion.⁶ While it is virtually impossible to avoid all sources of toxins and pollution in the modern world, you can safeguard your health by simply reducing the number of personal care and household products you use, as well as moving towards cleaner brand options for everyday use."



ASK THE EXPERT

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



Q

What is the best protocol I can make to a client who has reported a noticeable drop in libido?

ROSE HOLMES ADVISED: After ascertaining that this has also been discussed with a doctor in case of any underlying pathological condition, address issues of stress, anxiety and inflammation through dietary, lifestyle and supplement considerations. General overall fatigue can also contribute to reduced libido, so energy levels and sleep are important to consider.

A number of health conditions associate with reduced libido, including diabetes, heart disease, hypothyroid, arthritis and cancer. Some medications may impact libido, including anti-depressants and hypotensives, as can excessive amounts of alcohol.

Women may naturally find reduced interest in sex after pregnancy or whilst breastfeeding. Altered hormones in menopause may also have an impact, including by causing dry vaginal tissues. Reduced sex drive is not, however, an inevitable part of ageing.

In addition to addressing issues of fatigue, blood-sugar regulation, inflammation, sleep and adrenal and mental stress, practitioners should look at the side effects of any pharmaceuticals being used, levels of alcohol consumption and ascertain if relationship issues may be an underlying concern.

A number of botanical supplements have been shown to have libido enhancing effect and these can be

considered. Maca (*Lepidium meyenii*), a root vegetable from the Peruvian Andes, has been shown to be hormone-balancing for both men and women, offering adrenal support and supporting mental and physical performance, as well as sexual wellbeing. Gelatinized maca is better tolerated digestively, as maca is hard to digest raw. Maca powder can easily be added to drinks, used in cooking or taken as capsules.

Also from South America are catuaba (*Trichilia catigua*) and muria puama (*Ptychopetalum olacoides*), two trees native to Brazil. Catuaba was called 'the tree of love' by the Tupi Indians and may reduce anxiety, increase energy, as well as dilating and relaxing blood vessels. The root and bark of muira puama are rich in essential fatty acids and plant sterols, including beta-sitosterol and muirapuamine. Muira puama may enhance mood, increase energy, reduce stress, support sexual health and support cognitive



function in older individuals. These two botanicals are often taken together.

Damiana (*Turnera aphrodisiaca*) has adaptogenic, anxiolytic and mild anti-depressant properties. Damiana makes a tasty tea, may help support feelings of sexual wellbeing, and is often recommended for increasing libido in cases of anxiety or other psychological difficulties.

A blend of libido-boosting botanicals may also do the trick. In addition to the above botanicals, this might include *Epimedium grandiflorum* (horny goat weed), huanarpo macho, Tribulus, tongkat ali, Eustephia and suma (*Pfaffia*).

ABOUT THE EXPERT

Rose Holmes, Dip.ION, BSc (Hons), 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.





Q

What is the best way to assess a client I suspect may have SIBO and can you recommend an effective protocol to address it?

KATHERINE PARDO SUGGESTED: SIBO, or Small Intestinal Bacterial Overgrowth, has become a popular topic in the nutritional world of late. It's a relatively under-diagnosed GI condition that is thought to underpin many, if not most of IBS cases, and yet not many people have even heard of it. That's probably because a lot of the symptoms are the same as those classically described in IBS. For instance, some of the common symptoms of SIBO include abdominal bloating, gassiness, abdominal pain, discomfort and/or cramping, constipation and/or diarrhoea, nausea, headaches, joint/muscle pain and fatigue.

SIBO occurs when the bacteria that normally live in the large intestine migrate and multiply in the small intestine. You may get a number of signs that indicate SIBO, particularly those in the upper part of the GI tract (nausea, burping after meals, bloating or discomfort in the upper

part of the abdomen) or if you've done a stool test, there may be raised levels of the *methanobrevibacter smithii* bacteria, which can also be an indicator. But a firm SIBO diagnosis can generally only be made following a SIBO breath test. This test measures levels of hydrogen and/or methane gases in the breath after taking a challenge solution and is a solid indication of the levels of bacteria present in the small intestine.

Approaches to tackling SIBO differ widely between practitioners and will have varying degrees of success depending on the client and their lifestyle, and each treatment plan should be individually tailored to suit each client. However, most will have common themes and evidence has shown that a combination of the following elements will increase the chance of success in reducing or eradicating SIBO:

- Temporary dietary modification – reducing the number of certain carbohydrates known to feed bacteria and contribute to gas build up – for example, the FODMAP diet or the specific carbohydrate diet.
- Killing off bacteria using a herbal antimicrobial, such as berberine, caprylic acid or oregano, or antibiotics if required.
- Supporting digestion using digestive enzymes, hydrochloric acid etc.
- Healing the gut wall using glutamine.
- Once the baddies have been eradicated, increasing fermented foods in the diet and supplementing with a probiotic to restore beneficial bacteria levels and improve

diversity of the microbiome.

- Slow reintroduction of restricted foods to fuel the healthy population of bacteria and encourage diversity
- Employing stress reduction techniques, such as breathing exercises, meditation or yoga.
- Using a prokinetic supplement to help support the function of the migrating motor complex (MMC) and/or a biofilm disruptor to breakdown the protective matrix surrounding the bacteria may also prove useful.

Speaking to as many practitioners as we do, it's clear that the key to success for both practitioner and client when tackling SIBO is to remain flexible and adapt the approach as you go along, depending on how the client is responding. As with all health issues, when it comes to SIBO, no one size fits all.



ABOUT THE EXPERT

Katherine Pardo BSc (Hons), Dip ION is Head of Nutrition at nutritional supplement company, Nutri Advanced, one of the leading educators in the field of functional medicine. She originally trained as a Nutritional Therapist at the Institute for Optimum Nutrition in London and is committed to helping people make realistic and sustainable food and lifestyle choices for improved health and wellbeing.





Why should practitioners test clients' vitamin D levels and what is the best testing methodology?

BENJAMIN BROWN RECOMMENDED: Changing living conditions and our environment make it necessary for many people to take extra or less vitamin D daily. However, it is difficult to determine how much a client needs, for how long and how to maintain the required levels. In contrast to most other hormones, the self-synthesis of 25-OH-vitamin-D in our body requires sufficient skin exposure to UVB radiation from the sun to produce vitamin D3, which is later modified to 25-OH-vitamin-D. This concept was introduced by evolution millions of years ago and fitted perfectly as long as our food supply, activity and life conditions were adjusted to seasonal changes.

Nowadays, this dependency is in complete contrast to the lifestyles of most people because the requirements of the modern societies is no longer adjusted to the seasons. We spend most of our time inside of buildings or cars. Furthermore, most of our skin cosmetics contains sun-protection, blocking the UVB radiation required for vitamin D3 synthesis.

Approximately 80 per cent of the population is vitamin D insufficient (<30 ng/ml) in the winter period, and during the summer, less than 50 per cent achieve the minimum required to keep all vitamin D dependant systems active.

Fortunately, the public's awareness about this issue has substantially risen in the last few years. Even the general recommendations of national nutrition societies promote

daily vitamin D3 or D2 supplementation of 1000-2000 IU in order to avoid vitamin D deficiency – at least during the winter period.

Unfortunately – in the case of vitamin D – this kind of standard general recommendations for everyone do not fit the actual requirements of many people in order to achieve and permanently maintain vitamin D blood levels in the recommended range of 30-60 ng/ml. Thus, testing the clients' current vitamin D levels is an essential requirement to provide individual adjusted consultation and meaningful professional supplementation recommendations.

A VHC Reader allows a practitioner and client to see laboratory equivalent 25-OH vitamin D results within 15 minutes, anywhere and at any time, all within the reach of your fingertips to provide a better consultation. It is an immunochromatography-based one step in vitro test designed for the quantitative determination of total 25-hydroxy vitamin D in a human finger-prick blood. This assay provides a preliminary diagnostic test result and can be used for screening of vitamin D deficiency.

If a test identifies vitamin D deficiency, the quantitative result from the reader enables a practitioner to provide a personalised, accurate calculation of the amount of vitamin D3 IU needed through a targeted diet or supplementation plan to achieve a good blood level without any risk of an overdose or an under prescribing of the amount their client really needs.



ABOUT THE EXPERT

Benjamin Brown is a science writer and speaker specialising in nutrition and functional medicine. He is author of *The Digestive Health Solution* and is Contributing Editor to *Integrative Healthcare and Applied Nutrition (IHCAN)* magazine, Director of Clinical Education for Pure Encapsulations UK, and on the Advisory Board and Guest Lecturer at BCNH College of Nutrition and Health. Ben guest lectures at the Institute of Optimum Nutrition (ION) and the Centre for Nutrition Education & Lifestyle Management (CNELM).



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Why every child should be taking VITAMIN K2

Registered Dietitian Nutritionist, Aicacia Young, explains why vitamin K2 plays such a key role in children's health.



While many people think of vitamin K as a single vitamin, it may come as surprise that it is actually a group of fat-soluble vitamins that includes phyloquinones (K1), menaquinones (K2), and menadione (K3). Of these, K1 and K2 are naturally occurring, but K3 is synthetic and has been banned by the FDA for its toxicity.

Plants synthesise vitamin K1, which is why it can be found in leafy green vegetables, while vitamin K2 can only be produced through bacterial fermentation. Interestingly, gut bacteria can produce many forms of vitamin K2, the most commonly studied being menaquinone-4 (MK-4) and menaquinone-7 (MK-7). MK-4 can be found in organ meats, Gouda, Brie, and natto (fermented soybean), but only in small amounts. When looking to supplement with vitamin K2, research has shown that MK-7 is superior to MK-4 and even vitamin K1 in half-life, bioavailability, and safety for children.^{1,2}

Though many people have never heard of vitamin K2, this intriguing vitamin plays a surprisingly important role in paediatric health. Unfortunately, research indicates that vitamin K2

deficiency is very prevalent among infants and children. In fact, some research shows that 50 per cent of all newborns are deficient in vitamin K, mostly due to maternal vitamin K deficiencies.³ While vitamin K travels poorly across the placental barrier and is mostly lacking in breast milk, studies have found that maternal supplementation with vitamin K can help improve their newborn's vitamin K status.^{4,5}

Research has shown that high dose supplementation with MK-7 is an effective solution in improving vitamin K2 status.

A HEALTHY FOUNDATION

Childhood is a time of rapid growth and change. As children grow and mature into healthy adults, their bodies undergo significant physical changes. Not surprisingly, most of these changes depend heavily upon proper nutrition. While many parents understand the importance of healthy bones for their children, most of them are unaware of the role that vitamin K2 plays in bone development.

The most important period of bone development occurs

between childhood and adolescence, where up to 90 per cent of peak bone mass is acquired by age 18 in girls and age 20 in boys. For bone mineralisation to occur, the body relies on an activated form of osteocalcin to trigger the incorporation of calcium into the bone matrix.

Osteocalcin, secreted by osteoblasts, is a non-collagenous protein hormone responsible for bone mineralisation, ionised calcium homeostasis, insulin sensitivity, and testosterone biosynthesis. However, in order to have these many effects in the body, osteocalcin must be activated to its carboxylated form by vitamin K-dependent proteins, known as matrix-GLA proteins, or MGPs. This means that bone mineralisation can only occur in the presence of adequate vitamin K2.

Multiple studies have shown that adequate vitamin K2 status is directly related to strong, healthy bones in children. However, recent findings indicate that children may require up to eight-10 times more vitamin K2 than adults in order to support their rapid growth.⁶ Unfortunately, research shows that most children have sub-optimal levels of vitamin K2, which is likely due to the lack of

vitamin K2 in the standard Western diet.

In fact, a 2003 population study, investigating the incidence of forearm fracture in children over a 30-year period found that fractures increased by 32 per cent in males and 56 per cent in females from 1969 to 2001.⁷ Though these findings are multifactorial, they do suggest that the current intake of vitamin K2 is likely insufficient for optimal bone growth.

CAUSES OF VITAMIN K2 DEFICIENCY

The most common cause of a vitamin K2 deficiency is an excessive intake of calcium and/or vitamin D. The foods that children consume today are not only laden with sugar and many unnecessary additives, but they also tend to be fortified with large amounts of calcium and vitamin D.

This does not mean that calcium or vitamin D is harmful for children – quite the opposite. However, excessive consumption of calcium or vitamin D without vitamin K2 can cause calcium to deposit into the tissues and arteries, where it forms a cement-like plaque over time, instead of enhancing the bone matrix. Recruiting calcium out of the tissues and back into the bone matrix can effectively increase bone mineral density and decrease the risk of fractures in both children and adults.

WHAT TO LOOK FOR IN A VITAMIN K2 SUPPLEMENT

While most vitamin K2 products on the market are either synthetic or soy-based, there are a few supplements available created from the natural form of vitamin K2-7 that comes from fermented chickpeas. When choosing a vitamin K2 supplement for your clients (children and adults alike), look for one that has therapeutic dose levels of vitamin K2, ideally that also contains vitamin K1 and chelated minerals. These co-factors will help to improve the absorption of vitamin K2 and encourage optimal vitamin K status.

A two-year longitudinal study from 2008 found that children with superior vitamin K levels were more likely to have stronger and healthier bones than the children with poor vitamin K status.⁸ A year later, those same researchers found that eight weeks of

supplementation with vitamin K2-7 was enough to significantly improve vitamin K status in healthy pre-pubertal children, in addition to osteocalcin activation for stronger bones.⁹

Additionally, researchers found that children, as well as adults over the age of 40, both showed the greatest vitamin K2 deficiency and the highest responses to vitamin K2 supplementation.⁶ Because peak bone mass is reached by the early 30s, these findings highlight the importance of vitamin K2 supplementation during pregnancy, childhood, and after the age of 40.

VITAMIN K2 DOSAGE SUGGESTIONS FOR CHILDREN

For children under the age of 16, the suggested dose is 160mcg/day, unless the child is experiencing 'growing pains' or recovering from a broken bone. In these instances, 320-480mcg/day may be necessary.

Supplementation is recommended for children as early as one year of age. For children under the age of one, it may be more beneficial to have the mother supplement with vitamin K2 while breastfeeding.

VITAMIN K1: SOURCES AND ACTIVITY

Vitamin K1, unless otherwise noted, is the vitamin K that you will find in many multivitamins.

Vitamin K1 is:

- Found mostly in leafy green vegetables such as kale, spinach, Brussels sprouts and broccoli.
- Named for its role in coagulation (koagulation in Danish – hence the name vitamin K).
- Blood thinning drugs like warfarin work by inhibiting vitamin K-dependent activation of certain coagulation factors. If your client is taking warfarin, they should keep their dietary intake of vitamin K consistent and consult with their doctor before considering taking a vitamin K supplementation.

VITAMIN K2: SOURCES AND ACTIVITY

One of the reasons you may not have heard of vitamin K2 is that

it was assumed to be a different form of K1. Researchers now know that K2 has its own important roles in human health apart from coagulation:

- The liver packages vitamin K2 into lipoproteins before delivering them to the rest of the body.
- Some of the highest concentrations are found in the brain. [i]
- Found in highest quantities in a fermented soy product, natto. Vitamin K2 is also found in fermented cheeses, grass-fed butter and organ meats from healthy animals.
- K2-7, the form of vitamin K2 present in natto, has greater biological activity than K2-4, the synthetic form of vitamin K2. Along with being the most bioavailable form, K2-7 is also the most stable form.
- *Bacillus* spores produce some amount of K2-7 in the gut.
- Synthetic K2-4 and natto are both used as medicine in Japan. The primary use of K2-4 is osteoporosis, and natto is used as a treatment for dementia.
- The primary role of vitamin K2 is to carboxylate (activate) vitamin K-dependent proteins (VKDPs) that then perform essential functions in the body.
- Vitamin K-dependent proteins are responsible for bone production, cardiovascular health, energy production and brain health.



Aicacia Young, RDN is a Registered Dietitian Nutritionist in Austin, Texas. After receiving her undergraduate degree in traditional nutrition, Aicacia worked in the field of Functional Medicine, where she was trained by a functional MD to help patients from all over the USA treat and reverse their various autoimmune conditions through diet and supplementation. Aicacia now serves as the Director of Scientific Affairs at Microbiome Labs, where she stays up-to-date with the latest research concerning the gut microbiome.

Pure for practitioners

For more than two decades, Pure Encapsulations has prided itself on purity and quality, with strict criteria in terms of formulations. Its Director of Clinical Education, Benjamin Brown, set out why its ethos forms everything the brand does.



There are countless supplement brands available today, and with the nation's ever-growing interest in nutrition, this is set to only grow further. With greater demand comes a variation in quality of such products.

This is where Pure Encapsulations differentiates; not only does it boast 25 years' experience in the field of nutrition, it also has a hugely impressive line-up of experts involved in the business, who ensure the key pillars of its ethos are maintained at all times.

Benjamin Brown, a well-respected Naturopath, science writer and speaker, is Director of Clinical Education at the business and explained: "Pure Encapsulations was developed over 25 years ago by two practitioners, who wanted products that did not contain unnecessary additives or allergenic ingredients commonly used in food supplements, as well as products that were clinically effective. Since then, Pure Encapsulations has become the leading brand in functional medicine because of this commitment to purity, quality and efficacy."

Indeed, its reputation precedes itself as recently, Dr Mark Hyman, MD of the Institute

for Functional Medicine, explained that the reason he started using Pure Encapsulations 25 years ago is because there were very few companies that had the level of integrity about the sourcing of the raw materials, the purity of the product, the testing of the ingredients before and after manufacture to make sure it says on the label what's actually in the bottle.

And this philosophy will continue for the future too.

"Pure Encapsulations is the most trusted and most prescribed brand by health professionals (based on surveys by both *Nutrition Business Journal*, and The Institute of Functional Medicine). Our focus is on supporting the industry, advancing functional medicine and world class continuing professional education," Ben explained.

"Pure Encapsulations' medical advisory board includes many of the biggest names in functional medicine, many of which will be coming to the UK and Ireland for conferences. This September, Dr James Greenblatt, a pioneering physiatrist who uses nutritional medicine, will be keynote at the Integrative Health Summit, which Pure Encapsulations sponsor."



Benjamin Brown



THE PURE PILLARS

Priding itself on a strong reputation built on purity and quality, Ben explained that quality is defined by four criteria.

- **"Hypoallergenic:** Food allergies and sensitivities are on the rise, creating a unique need for nutritional supplements that are well tolerated and hypoallergenic. Some food supplements contain additives, so clean products without unnecessary ingredients are important for health-conscious people. Pure Encapsulations products use only high-quality pure substances without allergy-inducing additives. All raw materials and finished products are rigorously third-party tested for purity and quality, including heavy metals, over 70 pesticides, oxidation, adulteration, authenticity and potency to expiry.
- **Research-based:** Scientific research is a top priority for Pure Encapsulations. Only those compounds whose potency and clinical value have been validated through science or research go

into our formulas. More than 30 product-specific clinical studies have been published in leading peer reviewed journals and more than 20 ongoing studies. Pure Encapsulations were Recipients of the 2016 *Nutrition Business Journal (NBJ)* Award for Achievement in Science & Innovation.

- **Efficacy:** Pure Encapsulations products are formulated by nutritionists, PhDs and leading medical experts to provide strengths and dosing consistent with clinical experience and published research. Ingredients are selected for levels of active compounds, bioavailability and the most biologically active forms.
- **Trust in manufacturing:** Pure Encapsulations control the entire manufacturing process in our own state-of-the-art facility, from the selection of raw materials to product encapsulation. Each ingredient and every final product is independently tested for potency and purity. Stability testing is performed on all

products to ensure they meet specifications at the end of their shelf life. Pure Encapsulations is GMP certified and exceeds the standards of the USP for supplement manufacturing."

Today, the portfolio stands at more than 150 products, including vitamins, minerals, amino acids, fatty acids, botanical extracts, probiotics and special combination formulas.

Ben added: "We have several new products coming in 2019 and many more in 2020. Some areas that we are working on are gastrointestinal, metabolic, immune and neurological health."

FROM INGREDIENTS TO MANUFACTURE

Pure Encapsulations pays close attention to all aspects of the production process, starting with ingredient sourcing, right through to manufacturing.

Starting with raw materials, Ben advised: "All raw material and finished product is sent to third-party testing labs to verify purity



and potency. There are two tiers of testing: Raw materials are tested based on the following criteria; potency, microbes (total plate count, yeast, mold, *E. coli*, *Salmonella*, *S. aureus*, *P. aeruginosa*, *coliforms*), identity (by FT-NIR, HPTLC, TLC, and FAME or DNA for probiotics), heavy metals (mercury, arsenic, lead, cadmium), pesticides (over 70 compounds), solvents (over 32 compounds), allergens (when applicable), melamine (for all proteins), oxidation (for essential fatty acids), aflatoxin (for targeted ingredients), total viable count (for probiotics), enzyme activity (for enzyme products), and antimicrobial agents (for grapefruit seed extract)."

Added to that, finished products are tested for potency (to

ensure label claim through expiration), microbes (total plate count, see raw material testing), heavy metals and pesticides.

If we then turn to manufacturing, this occurs in-house in a state-of-the-art facility, which, Ben explained, is unusual as many brands use contractors.

"In-house manufacturing is fundamental to producing free from, hypoallergenic products that would not be possible otherwise," he advised, adding: "Similarly, extensive testing of all raw material and finished products is not common in the industry, so Pure Encapsulations go beyond what is required with third-party testing so you can be certain the products are safe, high quality



and effective.

"All Pure Encapsulations products are free from wheat and gluten, egg, peanuts, trans fats and hydrogenated oils, GMOs, magnesium stearate, titanium dioxide, carrageenan, coatings and shellacs, artificial colours, flavours and sweeteners, unnecessary binders, fillers and preservatives."

Why there is such a focus on being hypoallergenic is important, Ben pointed out.

"Remarkably, one-10 per cent of adults and children in the UK have a hypersensitivity to foods, and up to 20 per cent experience some adverse reactions. Also, free from foods are perceived as healthier as people become aware of allergens and additives," Ben explained.

"Allergens and potentially harmful additives are surprisingly common in food supplements but are often overlooked. For example, the market leading multivitamin in the UK contains the following additives; sodium benzoate, sorbic acid, BHT (butylated hydroxytoluene), artificial red, yellow, and blue aluminium lake, sucrose, palm oil, gelatine, acacia gum, calcium searate, crospovidone, hypromellose, polyethylene glycol, talc, and titanium dioxide. Hypoallergenic manufacturing procedures and third-party testing is fundamental to ensure safety for people with allergies. For example, Pure has Gluten Free Organization Certification (GFCO) and has found gluten contamination in probiotics that would not have been discovered otherwise. Vitamin C and cellulose (a hypoallergenic plant fibre) are used as alternatives to more common additives, such as magnesium stearate and potentially problematic additives, such as maltodextrin."



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CPD DIRECTORY

If you want to top up your CPD, take inspiration from these forthcoming events.

BANT Local Networking GI Map and Methylation Panel Genova Diagnostics

September 13 – Reading

CPD hours: BANT two hours

Speakers: Auriol Moores

Website: bant.org.uk/members-area/bant-local-networks/local-network-coordinators-list/#Auriol_Moores_&_Laura_De_La_Harp

The Exposome Cytoplan roadshow

September 19 – Leeds

October 17 – London

CPD hours: BANT six hours

Speakers: Miguel Toribio-Mateas, MSc, BSc (Hons), PgDip, FBANT, NTCC, rCNHC. Helen Drake, BSc (Hons) NT-Dip, mBANT, rCNHC

Cost: £35

Website: blog.cytoplan.co.uk/the-exposome/

BANT Professional Supervision

October 9 – Tunbridge Wells

CPD hours: BANT two hours

Speakers: Carmel Buckley

Cost: £30

Website: bant.org.uk/members-area/bant-supervision/meet-the-supervisors/#Carmel_Buckley

BANT Regional Branch Meeting Preconception, Pregnancy and Post-Partum Health

September 14 – Bristol

CPD hours: BANT 5.5 hours

Speakers: Angela Heap, Benjamin Brown, Christine Bailey

Cost: £20-£40

Website: www.eventbrite.co.uk/e/preconception-pregnancy-and-post-partum-health-tickets-57046254884

5G and Health – the Facts, Risks and Remedies

September 27 – London

CPD hours: BANT six hours

Speakers: Dr Damien Downing, Dr Erica Mallery-Blythe, Professor Martin Pall, Dr Dimitris Panagopoulos, Dr Lennart Hardell, Dr Peter Ohnsorge and Christian Blank

Cost: £165

Website: www.bsem.org.uk/events/11-5g-and-health-the-facts-risks-and-remedies

Profitable Practice Clinical Education (formerly Nutri-Link)

October 12 – London

CPD hours: BANT 5.5 hours

Speakers: Carmel Buckley

Cost: £234 (including VAT)

Website: www.clinicaleducation.org/event/profitable-practice-12th-oct-2019/

How to Attract Clients and Build a Business you Love (three month course with three contact days and online support)

September 18 – Richmond

CPD hours: BANT 15 hours

Speakers: Nicki Williams DipION, CNHC registered, mBANT

Cost: £750 full or £600 students/alumni

Website: www.ion.ac.uk/short-courses

Autophagy Answered – Key Approaches to Induce Autophagy and Achieve Cellular Regeneration Nouveau Health

September 28 – London

CPD hours: BANT six hours

Speakers: Dr Slaven Stekovic, Dr Marcus Stanton, Ben Brown, Alessandro Ferretti

Cost: £109

Website: www.eventbrite.co.uk/e/autophagy-answered-tickets-65529260783

IFM's Advanced Practice Module – GI (three- day course)

Clinical Education (formerly Nutri-Link)

October 22 – London

CPD hours: BANT 17.5 hours

Speakers: Liz Lipski, PhD, CCN, CHN. Gerard Mullin, MD, MS, CNSP, Patrick Hanaway, MD. Michael Ash DO, ND, BSc, RNT

Cost: £1,250 plus VAT BANT/IFM member rate

Website: apm-uk.org

FORTHCOMING WEBINARS

Target Publishing, which publishes *Nutrition I-Mag*, is hosting a series of webinars for practitioners.

Register at www.ihcanconferences.co.uk/webinar

Sexual Health: Libido, Infections and Ageing – Natural Therapies with Rio Health

Rio Health

Presented by Rose Holmes, Registered Nutritionist,
mBANT, BSc, Dip.ION, PGCE

Tuesday September 17, 6.30pm-7.30pm



Too often, sexual health issues remain unmentioned by clients. These can have a profound impact on whole body health and wellbeing. Sexual health issues may associate with a number of chronic diseases and may be an issue particularly for ageing men and women.

In this webinar, we will investigate some of the sexual health issues that clients may have, including issues of libido, erectile dysfunction, sexually transmitted microbial infections (for example, chlamydia, genital herpes, and trichomoniasis) and vaginal/urinary tract infections (for example, bacterial vaginosis). Discover herbal protocols and remedies to address sexually transmitted microbial infections. Learn how takuna, aamento, cumanda and other antimicrobials may help. Learn how catuaba, muira puama, epimedium grandiflorum (horny goat weed), huanarpo macho, tribulus, tongkat ali, eustephia, suma, maca, damiana and other natural ingredients may help issues of libido for men and women.

We will discuss why sexual health matters in whole-body health, as well as its association with conditions of reduced whole-body health.

Immune Dysregulation as a Driver of Auto Immunity: Understanding the Antecedents, Triggers and Mediators of the Fourth Biggest Killer in the Western World

Nutri Advanced

Presented by Jo Gamble BA (Hons)
DIP, CNM, cFMP, ABAHP, fellow ICT
Tuesday October 8, 6.30pm-7.30pm



With auto immunity being on the increase in the western world, understanding the implications of immune imbalance is paramount to creating homeostatic balance. The implications of gut dysbiosis, stress and viruses in the imbalance of TH1, Th2 and Th17 will be considered, with scientific research and clinical application being included.

Genetic influences, environmental exposure and the microbiome will be delved into through the experience of a functional medicine practitioner, who can apply the science to clinical protocols.

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Make it mindful

The Mindful Kitchen is a new recipe book to inspire you into healthier, better-for-you cuisine.



Apple cake lasagne



Roasted beetroot and
pistachio dip



Sweet rhubarb pie

Apple cake lasagne

Serves 8-10

If you had a rather tasty snack and decide to plant a seed from your apple in the garden, be warned; should it grow into a tree, it will produce an altogether different-tasting apple. In order to plant an orchard of cox, fuji or pippin, a branch of one of those trees must be grafted onto another to produce similar fruit. Thousands of apple varieties that we humans like to eat (and many more that we don't) grow in Asia, Africa, Europe, Oceania and the Americas, resulting from millennia of layers of human and natural history. Something to consider as you layer this apple cake lasagne.

INGREDIENTS:

- 6 small apples
- 1½ tsp cinnamon
- 50g/2oz sugar

FOR THE CAKE

- 340ml/11fl oz rapeseed oil, plus extra for greasing
- 270g/9½ oz plain flour, plus extra for dusting

- ½ tsp salt
- 2tsp baking powder
- ¼ tsp bicarbonate of soda
- 400g/14oz sugar
- 1tbsp pure vanilla extract
- 3 large eggs
- 4tbsp oat milk

METHOD:

1 Preheat the oven to 175°C/155°C fan/gas mark 3½ and grease a 33 x 23 x 5cm/13 x 9 x 2in cake tin with a little oil, then dust with flour.

2 Peel, core and slice the apples, thinly but not too fine. Mix the apples with the cinnamon and sugar and set them aside so that the sugar draws out some of the juice from the apples.

3 Combine the flour, salt, baking powder, bicarbonate of soda and sugar in a large bowl. I usually opt for unbleached, local and organic 'white' flour, which, in practice, is a bit more like wholemeal. This makes the cake more wholesome and a bit denser.

4 Whisk together the rapeseed oil, vanilla, eggs and

milk in a separate bowl. Slowly combine the dry and wet ingredients and whisk together until there are as few lumps as possible.

5 Pour half the mixture into the cake tin, then layer it with half the apple slices. Spread the remaining mixture on top, then layer with the rest of your apple slices. Pour any juices from your apples over your cake. Transfer the tin to the oven and bake for about 45 minutes. Check your cake after 45 minutes and return it to the oven at five-minute intervals until a small skewer or cocktail stick inserted in the centre comes out clean.

6 Cut into squares and serve. Any leftovers are just as good – if not better – the following day.

SWEET
RHUBARB PIE



ROASTED
BEETROOT &
PISTACHIO DIP



Roasted beetroot and pistachio dip

Serves 10-12

This dip brings a splash of regal reddish-purple to a picnic, and with it a reminder that your senses can trigger your instinctive ability to read the language of nature and reinforce your sense of self as a collaborator in the web of life.

INGREDIENTS:

- 6 beetroots, peeled and cut into bite-sized pieces
- 3 garlic cloves
- 2tbsp olive oil
- 100g/3½ oz pistachio nuts (shelled weight)
- Zest and juice of 1 lemon
- 2tbsp tahini
- Handful of chopped mint leaves
- Salt and pepper
- 1-2tbsp cold water

METHOD:

- 1 Preheat the oven to 200°C/fan 180°C/gas mark 6. Put the beetroots and garlic into a baking dish and drizzle with the olive oil. Cover and roast until tender, about 40 minutes. Remove from the oven and leave to cool.
- 2 Meanwhile, shell the pistachios and enjoy a few mindful moments to consider the purpose of colour in nature as you work. Why do you think pistachios and beetroot have such signature colours?
- 3 Put the cooled beetroot and garlic, including any oil and juices, into a food processor with the lemon juice, tahini, mint, most of the pistachios and a pinch of salt and pepper. Process and add a tablespoon or two of water to make it smoother if necessary. Place in a serving dish, or simply pile onto lettuce leaves, and add the remaining few chopped pistachios and the lemon zest for a contrasting colour sensation.

APPLE CAKE
LASAGNE



SWEET
RHUBARB PIE





Sweet rhubarb pie

Serves 8

I love baking pies to share with friends and as I do, I lend a thought to what secrets the plant that provided my filling shared with me. This one is all rhubarb but when strawberry season arrives, I mix strawberries and rhubarb together for a delicious combination. A little vinegar in the pastry gives a tang to the buttery pastry, a flavour I recall from my childhood days.

INGREDIENTS:

FOR THE PASTRY:

- 325g/11½ oz organic plain flour, plus extra for dusting
- 2tbsp sugar
- 175g/6oz butter
- 1 egg
- 2tsp white wine vinegar
- 4tbsp ice-cold water
- Salt

FOR THE FILLING:

- 1.1kg/2lb 8oz rhubarb, chopped
- 300g/10½ oz sugar
- 1tbsp plain flour
- ½ tsp ground cinnamon
- 1tsp vanilla extract or vanilla sugar
- 50g/2oz butter

METHOD:

- 1 Preheat the oven to 190°C/fan 170°C/gas mark 5 and lightly grease a 23 x 18cm/9 x 7in pie dish.
- 2 Put the flour, sugar, butter and a pinch of salt in a bowl and blend by criss-crossing two forks or rub in with your fingertips until the mixture resembles fine breadcrumbs. In a separate bowl, whisk the egg, vinegar and water. Pour into the dry ingredients and mix into a ball using your hands.
- 3 Divide the ball in half and put one half in the fridge. Roll out the second half on a lightly floured surface until about 5mm/¼ in thick and use to line the pie dish, allowing the edges to overhang.
- 4 Mix the rhubarb, sugar, flour, cinnamon and vanilla in a large bowl and then pour it into your pastry-lined dish. Dot the filled pie with the butter.
- 5 Thinly roll out the other piece of dough until just bigger than the top of the dish. Lay over the filling, trim off the excess pastry and pinch the top and bottom pastry edges together to seal the pie. Make a few cuts in the top so the pie can breathe. Use any leftover scraps to make shapes to decorate your crust.
- 6 Cook in the middle of the oven for about one hour, checking after 40 minutes to ensure the crust doesn't burn. Cool slightly before serving.

ROASTED
BEETROOT &
PISTACHIO DIP



APPLE CAKE
LASAGNE



The Mindful Kitchen: Vegetarian Cooking to Relate to Nature, by Heather Thomas, is published by Leaping Hare Press on October 1, RRP £20.



I-Mag giveaways



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

NUTRIGOLD OXYCELL

Nutrigold's OxyCell includes vitamins, minerals and natural plant extracts with proven antioxidant potential. Vitamins C and E, zinc, manganese and selenium all contribute to the protection of cells from oxidative stress alongside OxyCell's unique phytonutrient mix, including curcumin, quercetin, lycopene, lutein, grapeseed and green tea extracts. These plant pigments naturally concentrate in the external tissues and core of edible plants to defend their cells and DNA against environmental stresses.

I:Win: We have 10 to give away.



BIOCARE EVERYDAY BIOACIDOPHILUS

We are all unique but many of us share a common challenge – hectic lives. Our environment, fatigue, diets and general pressures all play a part. Everyday BioAcidophilus is designed to help our bodies cope with the demand by offering you 10 billion, clinically researched LAB4 live bacteria per capsule, with no need for refrigeration. The handy seven day blister strips mean it's really easy to take with you on the go. Every day, everywhere – easy.

I:Win: We have 10 to give away.



BIO-KULT LUNCHBOX GIFT SET

We're all for a healthy lifestyle – home-made healthy lunch kept cool? Check? Live bacteria supplements? Check! This set contains one lunch bag, one Bio-Kult 60, one Bio-Kult Infantis, one Bio-Kult Migréa, one Bio-Kult Candéa and one Bio-Kult Pro-Cyan.

I:Win: We've got one set to give away.





NourSea Calanus[®] oil Omega 3 wax esters

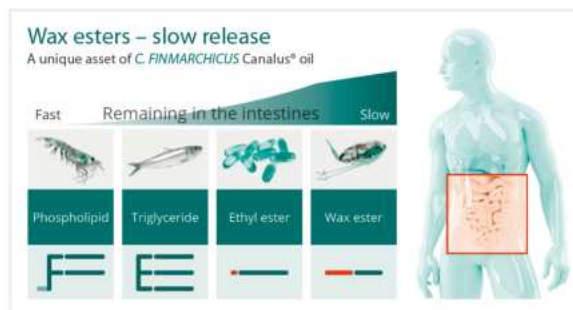
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Energy-rich & better absorption

Health through nature, science and innovation



Calanus[®] oil is a new, bioactive form of omega 3. This oil is a natural lipid extract derived from plankton of northern waters.

Calanus[®] oil comes in the form of natural wax esters. This oil is more energy-rich and has a better absorption. These fatty acids are released lower in the intestines than other forms of omega 3. The form of omega 3 is at least as important as the amount that is taken.



Calanus Finmarchicus is caught in northern Arctic waters. The total biomass is about 300 million tons, several times larger than the total biomass of fish in those waters.

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The recommended use is one to two softgels twice daily with or after a meal. Do not exceed the recommended use.
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