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JULY/AUGUST 2019

A HEALTHY START

Supporting children's health through nutrition

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Welcome

It may only be July, but 2019 has already bought with it many highlights when it comes to nutritional education, thanks to the ever-popular series of IHCAN Conferences.

As this issue of *Nutrition I-Mag* goes live, the team here is looking forward to attending the biggest IHCAN Summit to date, and then it's onto the last couple of conferences for the year, before we bring another year of education to a close. And given our September event is currently sold out, if you do want to attend a conference before the end of the year, be sure to reserve your place at November's event as it is close to selling out. You can reserve your ticket at www.ihcanconferences.co.uk or call the team on 01279 816300.

Education, as we all know in this sector, is the lifeblood for a Nutritional Therapist, and we take that seriously at *Nutrition I-Mag*, which is why you are able to earn yourself valuable CPD points by reading the magazine. And in this issue, there is a vast amount of important information for you to learn from; we have an extensive look at children's health, with advice from leading experts around the important nutrition considerations to make through various stages. Also of focus this issue is the increasingly popular area of mycology, where we bring you the advice you need to recommend medicinal mushrooms in practice. And then it's onto food intolerance and the questions to ask if you believe a client may be experiencing an issue.

Find out more about how to log your points at www.nutritionimag.com

Rachel

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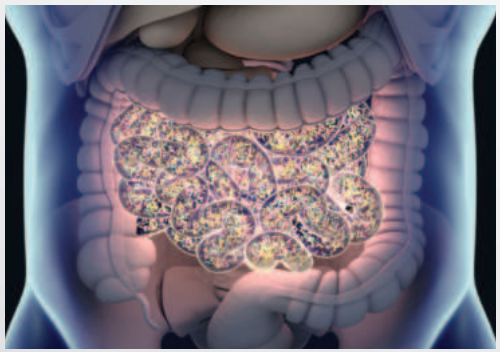

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OUR CONTRIBUTORS

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

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Attila Födi is Head of Education at Hifas da Terra and an 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.

Dr Peter Köppel

Dr Peter Köppel has a PhD in Biochemistry and Immunology. He was trained in biochemistry, with a special interest in clinical immunology, at the Institute of Virology at the University of Zürich. He then worked as a researcher in osteoarthritis and osteoporosis in a pharmaceutical company. For over 20 years, Dr Köppel led the research and production of specialised naturally extracted nucleotide ingredients, conducting over 400 trials for animal and human health. This led him to being recognised as one of the world's foremost experts on nucleotides for health and performance.

Christie Newman

Christie Newman is a researcher in nutrition and food policy, specialising in nutritional supplements/nutraceuticals. After receiving her first class honours undergraduate degree in Applied Food and Nutrition BSc from University College Birmingham, where she is a regular guest speaker in food and nutrition related subjects, Christie is now studying a MSc in Food Policy at City University London, whilst working as Nutrition Manager for elénzia.

Rachel Bartholomew

Rachel Bartholomew BA(Hons), Dip ION, MBANT, CNHC, GHW is a Nutritional Therapist and Health Writer with a special interest in functional and lifestyle medicine. She combines her own clinical practice in Lancashire with writing and research for Nutri Advanced, working alongside the nutrition team to produce a range of educational resources. She graduated from the Institute of Optimum Nutrition (ION) in 2004, has completed NLP practitioner training, and is a member of BANT, CNHC and the Guild of Health Writers.

Hannah Braye

Hannah Braye NT, DipCNM mBANT, CNHC is a Nutritional Therapist, having studied at the College of Naturopathic Medicine (CNM), where she graduated with an award for outstanding performance. She is a member of BANT and listed on the Complementary and Natural Health Care Council (CNHC) approved accredited register. She is a Technical Advisor at ADM Protexin, manufacturers of the Bio-Kult and Lepicol ranges.

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News bites

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

Consultation announced by Government over mandatory folic acid fortification

The Government has announced it will be consulting on plans to introduce mandatory fortification of flour with folic acid in a bid to reduce neural tube defects.

The news has been welcomed by certain organisations, however, it did come with a warning from the Health Food Manufacturers' Association (HFMA) that there is a risk of relying on fortification alone.

Public Health Minister, Seema Kennedy, made the announcement, revealing that health departments in England, Northern Ireland, Scotland and Wales are asking for views on the proposal to add folic acid to flour. The 12-week public consultation will explore what kinds of products should be included as part of ongoing efforts to encourage women who are trying to become pregnant to take a daily supplement of 400mcg of folic acid before they conceive and during the first 12 weeks of pregnancy to reduce the risk of neural tube defects, such as spina bifida.

The Government explained that more than 60 countries worldwide now add folic acid to their flour, including Australia, Canada and the US, and in Australia, neural tube defects fell 14 per cent after it introduced the legal requirement to add folic acid to bread flour.

Kennedy commented: "The simple measure of adding folic acid to flour would help spare hundreds of families from such a life-changing event. Women from the poorest areas are less likely to take folic acid supplements and it is right that we do all we can to protect the most vulnerable in society."

Kate Steele, Chief Executive of spina bifida charity, Shine, added: "Shine is delighted that the consultation on how mandatory fortification of flour with folic acid will be introduced in the UK has now been launched. After more than 25 years of campaigning for this, we look forward to the day that mandatory fortification with folic acid finally becomes a reality. Its introduction will change many lives for the better by reducing the incidence of anencephaly and spina bifida. This relatively simple step will give new babies and children, and their families, the chance of happier, healthier lives."

While the HFMA said that it welcomed and actively supported the importance the Government is placing on vital preconception folic acid intakes with its latest fortification plans, the organisation raised concern at the real risk that relying on fortification alone will confuse advice on essential folic acid supplementation, leaving some women of childbearing age believing that including bread in their diets will be enough to adequately reduce the risk of neural tube defects in pregnancy.

In a statement, the HFMA pointed out that consumption of bread in the UK has declined by 12 per cent in the last five years, even more so amongst the particular at-risk group, and combined with the current low uptake of supplements prior to pregnancy, there is a danger that the modest amount of folic acid provided by fortification will not address the nutritional needs of most women of childbearing age.

"There is no question that the overall folate status of the general population would improve as a result of mandatory fortification. But raising awareness and education on the need to continue to consume 400mcg of folic acid both before and during the first trimester would become even more important," the HFMA commented.

"We believe there is a real risk of the law of unintended consequences coming into play on this issue, as women of child-bearing age may mistakenly believe that including bread in their diet means they are no longer at risk, whereas the modest additional intake from this source cannot provide the full protection required."

The HFMA will be responding in due course to the Government's consultation.

British Acupuncture Council hits back at negative claims from Royal Society for Public Health

The British Acupuncture Council has called on the Royal Society for Public Health to retract negative claims it says it made about acupuncture.

The Chief Executive of the British Acupuncture Council (BAcC) has asked the Royal Society for Public Health (RSPH) to withdraw its claims that acupuncture poses a serious risk to the public, which follows a report from the RSPH, *Skins and Needles*, which said one in five people who have a tattoo, a body piercing, electrolysis or acupuncture suffer some sort of health setback as a result.

Teresa Williamson, acting CEO of the BAcC, has since written to RSPH Chief Executive, Shirley Cramer, after the claims were published by multiple news outlets, setting out the BAcC's commitment to upholding stringent safety standards to protect the public and support its members.

She said: "We have been contacted by many of our members who were alarmed by the report and felt that they had been misrepresented. The BAcC is regulated under the Professional Standards Authority's accredited register scheme, a Government-backed scheme to protect the public. We work hard to ensure we meet the stringent criteria set out by the PSA in order to protect the public and support our members.

"As the leading acupuncture body in the UK, we are committed to ensuring the standards of professional acupuncture remain exemplary."

Ian Stones, Safe Practice Officer at the BAcC, added: "The British Acupuncture Council (BAcC) welcomes any measure that brings unregistered practitioners up to the high standards we uphold, as anyone operating at sub-optimal levels of hygiene reflects badly on the whole profession."

The RSPH is calling for legislation to ensure that all practitioners providing procedures in which the skin barrier is broken have a qualification in infection control as a condition of getting a licence from the council. While welcoming the recommendation, Mr Stones argues that members of the BAcC should be exempt as they already meet published safety standards as part of their registration.

In an email to members of staff at the British Acupuncture Council, policy and research consultant at the RSPH said Deputy Chief Executive, Duncan Stephenson, had agreed to a meeting to discuss the issue.

Lack of sleep, poor diet and risk of obesity highlighted in new nutrition survey

A new report from the British Nutrition Foundation (BNF) has highlighted that adults and children are not getting enough sleep, risking poor diets and obesity.

The research reveals that 43 per cent of adults reported sleeping less than the recommended minimum of seven hours on the previous night, and that 32 per cent of primary and 70 per cent of secondary school children reported sleeping less than nine hours on the previous night, despite emerging research linking poor sleep quality to less healthy food choices, and increased risk of obesity.

The research, conducted as part of BNF Healthy Eating Week, which took place in June, surveyed 6,018 primary and secondary school students aged seven-16, and 1,576 adults from across the UK.

Dr Lucy Chambers, Senior Scientist at BNF, commented: "With more and more emerging research linking lack of sleep to poor dietary choices, and the burgeoning obesity crisis in the UK, we are keen to place a new focus on sleep this year – looking into how well we're actually all sleeping, and providing advice and resources to help improve sleeping habits."

The survey also revealed that a quarter of secondary school students reported not having anything to eat before school on the day of the survey, with one in 10 primary school students reporting not eating breakfast that day and 34 per cent of adults.

The survey also revealed what some of the barriers might be to a good night's sleep, with 59 per cent of secondary school students, 50 per cent of adults, and 49 per cent of primary school students stating that they used screens just before bed. On top of this, one in 10 (nine per cent) secondary school students, and one in six (16 per cent) adults, reported drinking a caffeinated drink before bed, while nearly one in 10 (eight per cent) consumed alcohol before bed.

The BNF's Task Force report, *Cardiovascular Disease: Diet, Nutrition and Emerging Risk*, published earlier this year, highlighted that lack of sleep, and interrupted sleep, may be linked to an increased risk of heart disease, stroke, type 2 diabetes, obesity, and hypertension.

Wassen commits to research project

The University of Roehampton and Wassen International have announced a research deal to progress studies on the Efamol brand.

The three-year partnership will see Wassen working with Dr Simon Dyall, Senior Lecturer and Course Convener for the MSc in Clinical Neuroscience, who has completed two studies into the relationship between omega 3 fatty acid intake and mobility and cognitive function in older adults. Efamol is now working with Dr Dyall on two further studies continuing to look at the role of omega 3 fatty acids combined with other nutrients for brain health, in particular stress and anxiety.

Dr Dyall commented: "We will be undertaking two studies in young adults. The first will be a short duration study of 12 weeks to look specifically for the first time at the effects of supplementation on those with low blood omega 3 fatty acid levels and the second will be a longer six-month study. This will not pre-screen for fatty acid status to ensure a diverse study population but will look at the responses in different circulating omega 3 fatty acid levels."

Victoria Malcolm, Marketing Director for Wassen, added: "We are delighted with the work that has already taken place looking at mobility and cognitive function in older women and will be announcing the results of this study in June. We look forward to our continued relationship with the university to support the launch of new products in the future."

In Research

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

Scale of vitamin D deficiency revealed in new study, with more than half of over 50s lacking

A new study published in the journal, *Nutrients*, has revealed high levels of vitamin D deficiency among older adults, leading to calls for greater awareness about its importance.

Researchers investigated vitamin D status in a large population of English community-dwelling adults aged ≥50 years The specific aims of this study were to establish the prevalence of serum 25(OH)D deficiency in older adults, to determine the prevalence of deficiency by region of residence and, to identify the potential determinants of deficiency.

The study involved 6,004 adults, from wave six (2012–2013) of the English Longitudinal Study of Ageing (ELSA). Deficiency was categorised by two criteria; Institute of Medicine (IOM) (<30 nmol/L), and Endocrine Society (ES) (<50 nmol/L). The overall prevalence of Institute of Medicine (IOM) and Endocrine Society (ES) definitions of deficiency were 26.4 per cent and 58.7 per cent, respectively.

Females, those aged 80-plus, smokers, of non-white ethnicity, being obese, and of poor self-reported health were all more likely to be vitamin D deficient (by IOM). Residents in the south of England had a reduced risk of deficiency, while other factors, such as being retired, having a normal BMI, engaging in regular vigorous physical activity, vitamin D supplement use, sun travel, and summer season were also significantly positive correlates of deficiency. Similar results were observed for the ES cut-off definition. Importantly, more than half of adults aged >50 years had 25(OH)D concentrations <50 nmol/L.

"These findings demonstrate that low vitamin D status is highly prevalent in older English adults and the crucial importance of public health strategies throughout midlife and older age to achieve optimal vitamin D status," the researchers commented.

"In conclusion, the high prevalence of vitamin D deficiency identified in this cohort highlights the need to raise awareness and have adequate public health strategies for achieving optimum vitamin D concentrations to support successful ageing. Based on our findings, there is a particular need to raise awareness and target those most at risk of vitamin D deficiency. At a population level, supplement uptake remains low and a mandatory food fortification policy needs to be urgently considered as it may have the widest reach in tackling vitamin D deficiency, since it has shown to be enormously successful and safe in other far northern European countries."

Protein reduces risk of frailty among older women, study suggests

A new study has concluded that adequate protein intake is associated with a lower risk of frailty and prefrailty in older women.

According to the research from the University of Eastern Finland and Kuopio University Hospital, the researchers, writing in the *European Journal of Nutrition*, examined associations between protein intake and protein sources with frailty status in older women, explaining that adequate protein intake is defined as at least 1.1g per kilogram of body weight.

Participants were 440 women aged 65-72 years enrolled in the Osteoporosis Risk Factor and Prevention-Fracture Prevention Study. Their protein intake in grams per kilogram of body weight was calculated using a three-day food record at baseline in 2003-2004. At the three-year follow-up in 2006-2007, frailty phenotype was defined as the presence of three or more, and prefrailty as the presence of one or two of the Fried criteria; low grip strength, low walking speed, low physical activity, exhaustion (defined using a low life satisfaction score), and weight loss of more than five per cent.

The study shows that getting the recommended amount of dietary protein was associated with a lower risk of frailty and prefrailty in older women. Moreover, the consumption of animal protein was associated with a lower likelihood of frailty.

"The public health recommendation is to eat an optimal diet with an adequate intake of protein. Adequate protein intake is important for muscle health and, according to the new results, may also prevent frailty. However, further research is still required in this area," commented Senior Lecturer, Arja Erkkilä, from the University of Eastern Finland.

Exercise and its importance on cancer survival to be researched

Northumbria University has announced it is researching the impact of exercise on survival of cancer.

Researchers are investigating the important role that structured exercise programmes can play in living with and beyond cancer.

Led by John Saxton, Professor in Clinical Exercise Physiology and Head of the Department of Sport, Exercise & Rehabilitation at Northumbria, the research is a collaboration with clinical colleagues from NHS Foundation Trusts in the North East, Norwich and Sheffield.

"Physical activity and structured exercise have an important role to play in alleviating the physiological and psychological impact of cancer and its treatments," explained Professor Saxton. "Cancer is now considered a chronic condition because more people are living longer after a cancer diagnosis. This research is about using physical exercise as part of lifestyle interventions to improve the health of people living with and beyond cancer."

Current research is focused on the role of exercise in conjunction with dietary advice in reversing adverse body composition changes – such as increased fat mass and reduced lean body mass – for patients recovering from hormone-receptor positive breast cancer. Newcastle, Gateshead and Northumbria NHS Foundation Trusts are taking part in the North East. In addition, a large-scale multi-centre trial is investigating how exercise programmes prior to surgery can be used to improve fitness and treatment outcomes in colorectal cancer patients across the UK and includes Northumbria Healthcare NHS Foundation Trust in the North East.

"We know that common cancers, such as cancers of the breast, prostate and colon can be linked to excess body weight and if patients put weight on after treatment, this can be linked to poorer outcomes," Professor Saxton added.

"There is a real need to provide sustainable lifestyle support, including regular exercise, healthy eating and maintenance of a healthy body weight. This isn't just about quality of life, as it can also benefit long-term disease outcomes, such as risk of cancer recurrence and the development of cardiometabolic diseases such as type 2 diabetes and cardiovascular conditions."

Scale of CVD in Scots revealed in new research

Some 72 per cent of Scottish people have been affected by cardiovascular disease, according to the results of new research.

According to national charity, Heart Research UK, almost three quarters of Scots have been personally affected, or had someone they know affected by heart disease. This follows on from current statistics show which you are almost twice as likely to die from coronary heart disease in Scotland than in the South East of England.

The YouGov study produced for the charity's Heart of Scotland Appeal asked 1,000 Scots a number of questions relating to lifestyle choices and personal experiences of cardiovascular disease, finding that despite being Scotland's biggest killer, with 41 people a day dying from (CVD), 50 per cent of Scots are not concerned about cardiovascular disease.

Professor Nawwar Al-Attar, Consultant Cardiac and Transplant Surgeon, Golden Jubilee National Hospital, Clydebank and Spokesperson for Heart Research UK commented: "Historically, Scotland has had a high incidence of cardiovascular disease compared to the rest of the UK. Although great improvements have been made in the prevention and treatment of cardiovascular disease over the last decade, coronary heart disease is still Scotland's biggest killer. With an ageing population and rising levels of obesity and diabetes, this progress could be reversed which is why we need to act now. We can all reduce our risk of developing heart disease by leading a healthy lifestyle which means eating healthily, exercising regularly, maintaining a healthy weight and not smoking."

New to the market

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

HTC BUILDS PORTFOLIO

Hair, Skin and Nails Gummy is the latest addition to the expanding portfolio at HTC Health.

The award-winning wholesaler of health supplements has developed the nutritional gummy as the latest addition to its wide range of dietary supplements.

Catering to current consumer trends by ensuring this product is suitable for vegetarians, each serving provides a daily dose of vitamins A, C and D3, along with vitamins B6, B12 and biotin, as well as minerals such as selenium and zinc. It also contains added vitamin E, a powerful antioxidant.

Using pectin as the base of these gummies means they are suitable for vegetarians. HTC ensures all its gummies are strictly soy, dairy and gluten free. They all have non-GMO ingredients, no hydrogenated fat and only natural colours and flavours, with no preservatives.

MAKE IT A MULTI

G&G has turned the focus on its multivitamin offering with the launch of Mega Minus.

The unique supplement has been designed with all the nutrients contained in its Mega Multi, but with exceptions to make it tolerable for those who are sensitive to certain vitamins and minerals.

The multi contains no iron, choline, copper, iodine and vitamin A, while it does contain vitamins C, D3, E, a range of B vitamins, vitamin K2, selenium, chromium and biotin, among others.

DAIRY FREE DELIGHTS

Plant-based brand, Plenish, has announced the launch of three new dairy free drinks.

Its M*lkshakes range have less than half the sugar and 30 per cent fewer calories of dairy equivalents.

The range boasts three indulgent flavours, Chocolate Almond, Coffee Almond and Almond Butter, and are made with just a handful of natural ingredients and no additives, emulsifiers or stabilisers.

Plenish points out that the drinks are also better for the environment, producing 66 per cent fewer CO2 emissions than dairy.

NUCLEOTIDE ANNOUNCES NEW FORMULATION

The Nutri-tide NT supplement has been relaunched with an altered formulation.

Nucelotide Nutrition, which makes the supplement, explained that betaine and D-ribose, due to a relatively low inclusion rates, have been removed due to their highly hygroscopic nature. Instead, they are replaced with additional inositol, which is important for fat metabolism, insulin signalling, and nerve functioning, and complements the Nutri-tide nucleotide formula well.

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But not all CBD oils are created equal – far from it. As the industry is fairly new, how can you be sure what's in a bottle of CBD oil when you buy it?

Irish company Celtic Wind Crops is the leading provider of CBD products in the market and the only brand to be stocked in LloydsPharmacy here in the UK. Its CBD oil is totally unique in the fact that the whole goodness of the hemp plant is 'squeezed' into the bottle via a cold press, meaning it's pure and 100% natural. This is hugely different from other CBD oils on the market which extract the CBD from the hemp and place it in a carrier such as olive oil.

This means that Celtic Wind CBD oil is much more effectively absorbed into your body, and its natural blend of not only CBD but over 150 other compounds work together to boost your wellbeing further.

Celtic Wind Crops has generations of farming expertise, and also modern processing technology know-how, and it controls every step of its supply chain – from seed right through to shop shelf. The company produces its 100% natural oil in County Down without using fungacides, pesiticides or herbicides. The oil's also independently tested and analysed, to ensure you can guarantee what's really in that little bottle of goodness.

Celtic Wind Multi-Complex Hemp CBD Oil is now available in LloydsPharmacy, health stores nationwide and online at **celticwindcrops.com.**
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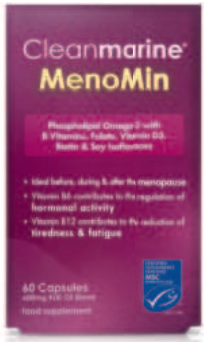
For more information visit
www.EnymeScience.co.uk

The Natural Approach to Menopause

Cleanmarine MenoMin is the natural approach to treating Menopausal symptoms. It's formulated using highly absorbable Omega 3 phospholipids combined with key ingredients including Vitamin D3, B Vitamins, Folate, Biotin, Soy Isoflavones and Rosemary extract. This synergistic combination is ideal for menopausal and peri-menopausal women, helping to regulate hormonal activity, maintain normal mucous membranes, as well as, reducing tiredness and fatigue.



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From Birth & Beyond

Bio-Kult Infantis is an advanced multi-strain formulation for babies, toddlers and young children. Each easy to use sachet contains seven protected strains of live bacteria, proven to survive the high acidity of the stomach. The formulation also contains vitamin D_3 to contribute to the normal function of the immune system, Preplex and DHA and EPA which are high in Omega 3 fatty acids. The formulation does not contain artificial colours, flavours or preservatives and does not need to be refrigerated.

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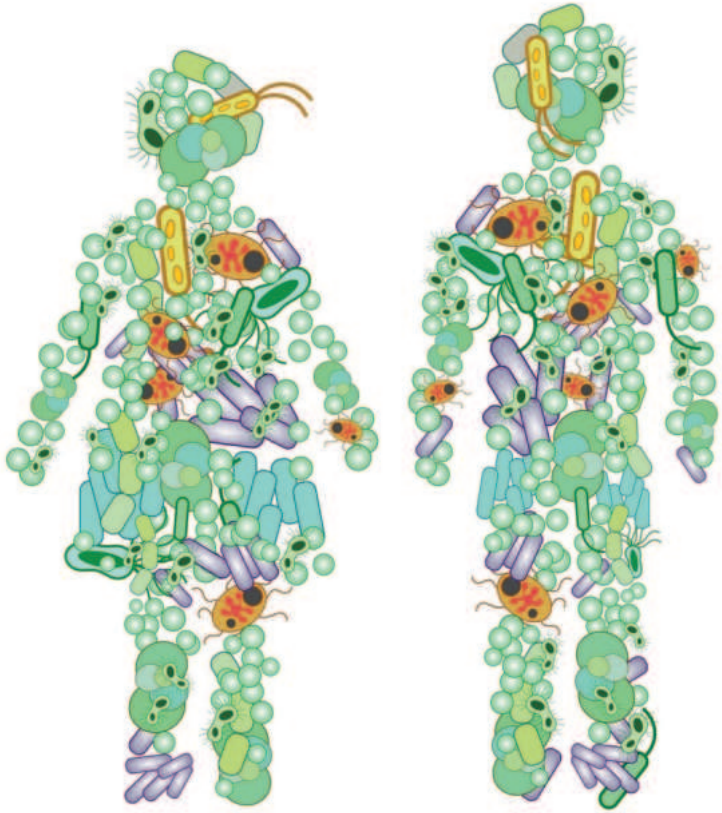
BANT News

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



BANT WELCOMES PROFESSOR TIM SPECTOR ET AL., PREDICT 1 STUDY

British Association for Nutrition and Lifestyle Medicine (BANT) welcomes the initial findings from the Predict 1 Study that individualised nutrition and lifestyle recommendations are key to human health.

BANT members have been working with their clients offering personalised recommendations for the past 22 years, since BANT's foundation in 1997, and were proud to have been selected to work with Professor Spector, the lead researcher on this study, on the precursor project to this study, Map My Gut.

The Predict 1 study confirms the nutrition ethos that BANT has been practising and promoting since its inception. BANT has repeatedly highlighted that a one-size-fits all health and nutrition policy, such as Public Health England's Eat Well Plate, is counter-productive and that the recent outdated calorie campaign is inappropriate. Calorie counting takes little to no account of the nutritional values of different foods and their relation to an individual's health and the continual tinkering of outdated nutrition science is putting the health of the British nation at risk and is contributing to the current National Health Service crisis.

Professor Tim Spector commented: "BANT Practitioners know that everyone responds differently to food because they see this in their practices on a day-to-day basis. Members of the public can experiment with this approach by signing up to www.joinzoe.com to be ahead of the curve when the app is available next year. Your local BANT Practitioner can help you understand your responses better to further personalise your food choices."

BANT Chair, Miguel Toribio-Mateas, who worked with Professor Spector on Map My Gut, added: "The preliminary results of the Predict Study are very encouraging. They support my belief that within five years, these kinds of tools will not be an option, but a necessity for nutrition practitioners to do their job effectively."

The study was undertaken by an international team comprised of researchers from Kings College, London, and Massachusetts General Hospital, alongside nutritional science company, ZOE; 1,000 participants, mostly made up of pairs of twins, consumed set meals and logged every mouthful of food or drink they consumed over a two-week period. Blood levels of sugar, fat and the hormone insulin were monitored throughout, and data on activities, sleep patterns, hunger and gut bacteria levels were also collected. The main findings were that even amongst the genetically identical twin pairs, blood glucose, fat and hormone responses to identical foods were widely different, confirming the study's hypothesis that no two people's responses to individual foods are the same.

Toribio-Mateas continued: "I am excited to see years of scientific data translated into a tangible application that can help change people's lives. This type of application of nutrition science is the future of clinical practice."

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SECURE YOUR PLACE AT THE LAST IHCAN CONFERENCE OF 2019

Time is running out to book your place at the final event of the hugely successful 2019 IHCAN Conference series.

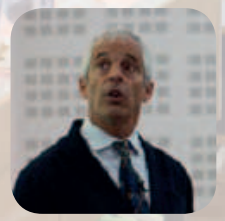
The 2019 IHCAN Conference series has been the best yet, having already welcomed Tom O'Bryan, Allison Siebecker, Dr Nigel Plummer, Dr Tanja Werner and many more through the doors of the Cavendish Conference Centre, in London, for a number of sell-out events.

The next conference in the series is taking place on Saturday, September 14, where we are very excited to have Dr Dale Bredesen return to 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. This conference is now sold out, but to be added to the waiting list, visit **www.ihcanconferences.co.uk**

Our last conference of the year is taking place on Saturday, November 23, where we will be joined by Patrick Holford 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 Holford, BSc, DipION, FBANT, NTCRP, 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'.


Patrick Holford


Tom O'Bryan


Dr. Elizabeth Philipps

He will be joined by Dr Elisabeth Philipps PhD, BSc Hons, BSc Nutr Med NNA, a Neuropharmacologist and Functional Medicine Nutritional Therapist with over 18 years' experience. Her extensive academic training includes a BSc (Hons) in Biomedical Science from Kings College London, a PhD in neuropharmacology from Oxford University and a BSc in Nutritional Medicine. Elisabeth runs a thriving health consultancy specialising in nutritional neurology and is also leading consultant for Nutrigold, co-ordinating its technical and education team, researching and delivering clinical presentations and developing bioavailable and efficacious food supplements. Her session titles will be confirmed shortly, so be sure to keep an eye on the website for updates.

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IN-CLINIC GUIDE TO CHILDREN'S HEALTH

Society today brings with it a range of health complaints among children that a generation ago were unheard of, as our panel of nutritional experts discuss.

Children's health has been in the news again recently with fresh concerns around lacking support for youngsters with mental health issues; a report by the Children's Society estimated that more than 100,000 10- to 17-year-olds seeking help are being turned away for support because their problems were not deemed serious enough. Whether the data is so stark because we are more aware of mental health these days, it certainly appears that incidents among the young are on the rise.

CLICK HERE FOR REFERENCES

And it's not just mind related health issues. Let's look at skin conditions, widely accepted to be on the rise, and a particular problem in the young. And that's before we look at concerns around childhood obesity.

While it's not necessarily the case that children are unhealthier these days than a generation ago, the health issues they face have changed, and it's important as Nutritional Therapists that the advice supports this.

Nutritional Therapist, Jenny Logan, Technical Training Manager at Natures Aid, commented: "According to recent reports, sadly many British children are not particularly healthy, nor are they following healthy diets. The National Diet and Nutrition Survey[1] indicated deficiencies across the board and obesity on the rise. The Royal College of Paediatrics and Child Health (RCPCH)[2] report states that child health in the UK is falling behind that of many other European countries, with obesity and metal health issues being key areas for concern. More than one in five children starting primary school in England, Scotland and Wales are overweight or obese.

"Mental health is an increasing issue for children and young adults and suicide is now the second leading cause of death during the teen years. Other major challenges include autism spectrum disorders, including Asperger syndrome, learning disorders, and ADHD (attention deficit hyperactive disorder). The UK has also seen an increase in cases of ricketts in recent years, a childhood issue which causes bone deformities. This has been linked to widespread vitamin D deficiencies."

Eleanor Issom, from BioCare, continued: "The question of the health of British children is one which has been, and will continue to be queried and discussed for many years. It has been recognised that the level of obesity within children continues to rise, with 30 per cent of children between the ages of two and 15 classified as overweight or obese. This statistic can have a significant impact when generalising the overall health status of British children, potentially swaying the health of this population into the decline as these levels continue to rise.

"There are also other aspects of children's health to consider, for example, up to eight per cent of children under three have food allergies, a dramatic rise since 1990. There has also been a huge increase in children experiencing difficulties with social, emotional and cognitive development, with over 200,000 children in England exhibiting a primary special educational need, 80 per cent of which have a moderate learning difficulty and five per cent profound, multiple learning difficulties."

She added: "In general, the health of the population of British children could be improved, especially when considering that these children are our future adult population. Addressing any health concerns at this stage in life and helping to prevent any further grievances could be key for improving the health of this population, as well as the health of future adult populations."

OBESITY ON THE RISE

One of the key issues facing parents these days is the expanding waistlines of their children and it has become a real cause for concern.

Logan advised: "Childhood obesity has been on the rise over the last 10 years, as lifestyles have become more sedentary and screen time has increased. In the UK, our children are now among the last active in the world, and fitness levels are plummeting as obesity is rising. Research comparing 38 counties across the globe placed England, Scotland and Wales among the worst for physical activity. Government advice says children should do at least an hour of moderate intensity physical activity per day. But just 15 per cent of girls aged 11 to 15 in England manage this, along with 22 per cent of boys, the report shows. These figures have deteriorated since 2014, despite repeated government pledges to address the issues[3]."

Keeley Berry, nutritional expert and New Product Development Executive at BetterYou, continued: "Obesity tends to be a key health concern across all age groups, with more than one in five children

starting primary school in the UK and Wales classed as overweight or obese. Children in deprived areas are the most likely to be affected by this as they tend to eat foods that are cheaper and are also less prone to spoilage. Many children will rely on a school meal to give them a balanced, nutritious meal and financially stretched parents are resorting to cheaper produce to fill a void rather than being able to provide their children with healthy, fresh food.

"Over the past decade, there has been a small improvement in the proportion of children starting school with a healthy weight. Sugar tax, better health education and the pressure to ban adverts for foods high in fat, sugar and salt before 9pm are likely contributors to this. It is still worrying, however, that one in three children are obese by the age of nine. The main issue here though isn't that they're carrying a little extra weight, but that we have seen an increase in the number of children suffering from type 2 diabetes, asthma and high blood pressure."

She continued: "While we're still seeing an increase of obesity in those children embarking on secondary school, another concern for this age group is the impact of mental health, which has become more apparent over the past 10 years. UNICEF has reported that, within the

last decade, young people in Britain experience low wellbeing when compared to those in other affluent countries. This is likely linked to bullying and disruptive behaviours at school, low physical activity and high levels of screen time in addition to poor nutrition and mental health."

ADDRESSING DEFICIENCY

Children are often not meeting even the basic five a day requirement, and this can lead to some concerning deficiencies.

"Nutrient demands continue to increase throughout growth and development, with the recommended Nutrient Reference Values (NRVs) for all vitamins and minerals increasing through to later childhood/early teenage years. Additionally, as children develop into young adults, life can get a bit tougher. There are higher expectations socially and academically and lots of demands on their time. These increased expectations can sometimes result in higher levels of stress and anxiety, which can increase the need for nutrients such as magnesium and B vitamins," Issom suggested.

"Eat the rainbow; fill their diet with the widest variety of fruits and vegetables (mainly vegetables) of different colours. Aim for seven to nine portions of different types per day to maximise their nutrient intake, to support the health of every system in their body. Try sneaking additions fruit and veg into smoothies, soups, stews and tomato sauces. Incorporate choline rich foods; choline is a key substrate for the neurotransmitter acetylcholine, which is fundamental to memory and learning. The best food sources of choline include runny egg yolks (eggs and soldiers!) and sunflower lecithin."

Logan added: "All nutrients are important, and likely to be deficient. Many parents are told that a well-balanced diet will provide all their child needs in terms of nutrition. However, this ideal relies on:

- A child happily eating the food it is given.
- A food containing all the nutrients it is supposed to.
- Parents having the time to make meals from scratch using the freshest, high quality ingredients.

"A survey of 21,000 people was carried out by the British Dietetic Association and found not one single person achieved the RDA for all basic nutrients, highlighting the importance not just of trying to promote a healthier diet, but also of multi nutrient formula. Recent published findings from the National Diet and Nutrition Survey (NDNS)[1] revealed that many children have shockingly low levels of several key vitamins and minerals. One of the most concerning findings from the NDNS was the fact that only eight per cent of young people between 11-18 ate the suggested five or more portions of fruit or vegetables – with the average intake being a meagre 2.8 portions. In this group of children, it was also discovered that, 28 per cent of girls and 15 per cent of boys had low levels of folate, 16 per cent of all boys aged 11- to 14 years are also at risk of not getting enough of this mineral through diet alone. Magnesium is essential for sleep, energy and immunity, as well as healthy bones and teeth so it's important to ensure teenagers are getting enough during this life stage."

And Issom continued: "As children grow and develop, it is important that their nutritional needs are met to help grow healthy bones and develop their body's systems. Certain nutrients are essential to optimise their baseline nutrition status, immune defences, digestion, memory, concentration and mood.

"As well as the previously mention vitamin D, essential fats and iron, other important nutrients to consider include zinc and vitamin C to support the immune system, as well as minerals such as calcium and magnesium to support the growth of bones and teeth."

BONE HEALTH

An obvious area of focus is with regard to bone development in the young.

"During childhood and adolescence, our skeletal system undergoes a lot of change as we grow in order to achieve peak bone mass. Without the proper environment, diet and hormones, this process can be hindered and increases the risk of fractures in childhood and later into adulthood. Magnesium is a vital component in establishing healthy bones, aiding the conversion of vitamin D into its active form so it can promote calcium absorption into the bones," Berry advised.

"Over half of teenage girls in the UK have intakes below the Lower Reference Nutrient Intake (LRNI) for magnesium, with 51 per cent of 11- to 14-year-olds and 53 per cent of 15- to 18-year-olds experiencing low levels and 20 per cent of teenage

children had low levels of vitamin A, 48 per cent of girls and 27 per cent of boys had low intake of magnesium and 44 per cent of girls and 23 per cent of boys had a low intake of selenium."

The following are considered the most important:

ESSENTIAL FATTY ACIDS

Crucial for most life stages, they are imperative in the young for a host of reasons.

Rachel Bartholomew BA (Hons), Dip ION, MBANT, CNHC, GHW, Nutritionist and Health Writer at Nutri Advanced, advised: "The links between omega 3 fatty acids and cognitive and developmental benefits in children are now firmly established. Back in 2005, the now famous *Oxford-Durham* study looked into the effects of fatty acid supplementation in children with developmental coordination disorder (DCD). The 2005 placebo-controlled trial involved 117 children with DCD and was led by renowned Oxford University researcher, Dr Alex Richardson. Dr Richardson and her team found that three months of supplementation with polyunsaturated fatty acids (PUFA) (80 per cent fish oil and 20 per cent evening primrose oil), compared to placebo, significantly improved reading and spelling abilities of the children. The omega 3 supplement was also associated with significant reductions in ADHD-related symptoms[1].

"In research analysis published in the *Journal of Nutrition* (March 2018), researchers reviewed and meta-analysed 38 randomised controlled trials (including 5541 participants) on omega 3 PUFA supplementation in mothers or infants (age < 2y) and evaluated standardised measures of cognitive or visual development up to the age of 18. Results showed that omega 3 supplementation improved childhood psychomotor, mental and visual development.

"Unfortunately, natural sources of omega 3 (nuts, seeds and oily fish) are often missing from a typical Western diet, which puts many people at risk of being low in these crucial fats. Many people wisely choose to add in a daily supplement of high quality, pure and stable omega 3 fish oil to make sure they are getting their optimal daily dose.

Logan added: "Omega 3, in particular EPA and DHA, are vital in brain growth and development, visual development and in supporting heart function. The period from birth to two years of age is considered primary growth phase for the human brain. Development, however, continues throughout childhood and into adolescence. Myelination of the frontal lobes begins around six months, with spurts of development identified at two years, seven-nine years and then again during mid-adolescence. Tissue content of DHA is thought to be important for this development.

"One of the key studies on the benefits of DHA in children was the DOLAB I study. This study investigated the effects of omega 3 on reading and behaviour in primary school children (ages six-10). (5) The study involved 362 children from 74 schools and compared the effects of DHA supplementation with a placebo. Reading ability and behaviour both showed significant improvement in the DHA groups. The poorest readers actually gained the greatest benefits.

"The body is unable to manufacture DHA, so it is essential that it is provided in our diets or supplements. The best food sources of DHA are salmon, fresh tuna, trout, mackerel and sardines. However, it is recognised that typical intake of these foods in children worldwide is low.[6]

Nutritionist Marianna Sulic, who advises for Savant Distribution, which has brands including Udo's Choice and Cleanmarine in its portfolio, added: "A great way to improve your child's fat consumption in their diet, in addition to eating nuts, seeds and avocado, is including a vegetarian omega 3 oil. Look for one that has the ideal 2:1 ratio of omega 3 to 6 and also includes vitamin E. An easy way to use the oil is add one teaspoon to smoothies, yoghurt or porridge."

Issom also advised: "Essential fats are potentially low within this population's diet due to the reduced intake of oily fish. Essential fats are pivotal for brain health and are vital as the body is unable to synthesise them. Omega 3 fats have been found to reduce inflammatory response, protecting the brain. Evidence has also suggested that omega 3 fatty acid

deficiency may contribute to a range of common and overlapping childhood neurodevelopmental disorders, including attention-deficit/hyperactivity disorder (ADHD), dyslexia (specific reading difficulties), dyspraxia, and autistic spectrum disorders."

VITAMIN D

Logan advised: "A study was carried out on vitamin D status amongst adolescents in Europe by the Healthy Lifestyle in Europe by Nutrition in Adolescence (HELENA) group. [4] Fasting blood samples were obtained from 1,006 adolescents aged 12-17 across nine countries; Italy, Greece, Austria, Spain, Sweden, Hungary, France, Crete, Germany, and vitamin D status was classified into four groups:

- Sufficient.
- Insufficient.
- Deficient.
- Severely deficient.

"The results showed that 39 per cent of the children had insufficient levels, 27 per cent were classed as deficient, and 15 per cent were actually severely deficient. This proved that even in sunny climates, children were at risk of health concerns due to vitamin D deficiency. In the UK, studies suggest that vitamin D deficiency is likely to affect at least half the UK white population, up to 90 per cent of the multi-ethnic population, and one quarter of all UK children. NICE, therefore, recommends that vitamin D supplements are used in pregnancy, breastfeeding and in children aged six months to four years."

Bartholomew added: "Type 1 diabetes is a chronic autoimmune disease and now the most common metabolic disorder in children under the age of 10. It is also increasing by between three to five per cent every year worldwide. Islet autoimmunity (IA) is a known precursor to the disease and happens when the immune system attacks insulin-producing islet cells in the pancreas. A large multinational study called the TEDDY study (The Environmental Determinants of Disease in the Young) is currently following 8,676 with elevated diabetes risk.

"In the latest part of the study, 376 children who developed IA were compared with 1,041 children who did not. In children with a vitamin D gene variant, researchers found that vitamin D levels were lower in those that went on to develop IA compared to those that didn't. These results show that higher childhood vitamin D levels are significantly associated with a decreased risk of developing IA, and subsequently, type 1 diabetes[2].

"This study mirrors findings of a similar study carried out in 2013 on 1,000 adult US military personnel, which found that those with an increased intake of vitamin D in adolescence had a reduced risk of type 1 diabetes later in life[3]."

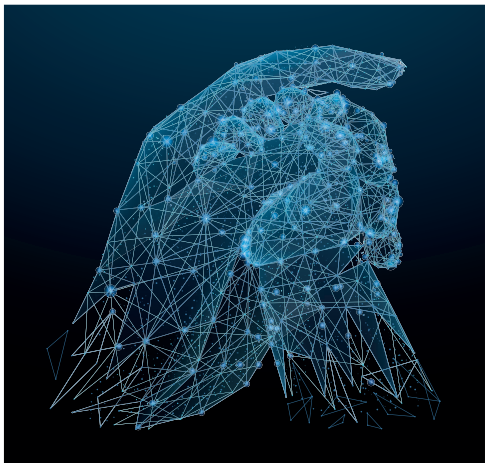
DIETARY GUIDANCE

So, from the perspective of a Nutritional Therapist, what advice do the experts believe should be offered around dietary considerations for children?

"Nutrition for children is based on the same principles as nutrition for adults. Everyone needs a balance of the same types of nutrients, such as vitamins, minerals, carbohydrates, protein and fat. Children, however, need different amounts of specific nutrients at different ages. Their appetite may fluctuate from week to week and even day to day, so don't be overly concerned if one day they are ravenous and the next day they pick at everything. Think about the bigger picture and if your child is getting a variety of healthy foods, whatever the portion size might be," advised Sulic.

"Consider a variety of nutrient-dense foods when creating meals and snacks for your child from the following categories:

- **Protein** – choose seafood and oily fish rich in omega 3, lean meat and poultry, eggs, beans, peas, soy products like tofu or tempeh, quinoa and unsalted nuts and seeds. Depending on the age of the child, you can either grind seeds to a powder and add it to smoothies or mix in yoghurts or chop nuts to a smaller non-choking size.
- **Fruits** – encourage your child to eat a variety of fresh fruit of different colours which will contain different nutrients. If you struggle to get your child to eat vegetables than try getting similar nutrients from fresh fruit. For example, if they won't eat carrots, then serve them mangoes and apricots. Canned, frozen and dried fruits are other options. Frozen is particularly handy for adding to smoothies. Bear in mind that dried fruit is naturally higher in sugar – one-quarter cup of dried fruit is equal to one cup of fresh fruit.
- **Vegetables** – serve a variety of vegetables for lunch, snacks and dinner. The key with children is being consistent with exposure. It may take 100 times of putting a broccoli floret on their plate for them to eat it, but if it's not on their plate in the first place then they won't be able to decide when to try it. Fresh, canned or frozen vegetables are suitable to use. Aim to provide a variety of cooked and raw vegetables, including dark green, white, orange, yellow and red, as well as, beans, peas and starchy vegetables like potatoes and sweet potatoes each week. When selecting canned or frozen vegetables, look for options lower in sodium.
- **Grains** – choose pasta, breads and flours from wholegrains, such as wholewheat, oats, spelt, kamut, buckwheat, quinoa, millet, brown or wild rice. Use alternatives like almond flour, chickpea flour, chestnut flour. If you start serving your child wholegrains from the start, they won't know the difference between them and the white flour version. The white flour versions have had most of their nutrients stripped away in



processing. Limit refined grains, such as white bread, pasta and rice and very much limit packaged cakes and biscuits.

- **Fats and dairy** – aim for three servings of dairy per day. I don't think adults should consume low fat or fat free versions and I most definitely don't think children should either. Healthy fats are good for our joints, metabolism, nervous system and brain function. Encourage your child to eat and drink full-fat dairy products, such as milk, yogurt, kefir and cheese. If you and/or your child are dairy free, then when choosing a milk alternative, make sure it has added calcium, which is extremely important for a growing child's bones and teeth. Healthy fats are important for a growing child's brain function, which helps with memory and concentration; healthy fats are naturally abundant in avocadoes, oily fish, nuts and seeds and their oils and olive oil."

CHILDHOOD SUPPLEMENTATION

There are some key supplements that parents should be recommended their children take – and these are often deficient in youngsters.

"A multivitamin and mineral supplement can be given to your growing child for overall nutrient support, but it shouldn't be taken in replacement of eating a healthy diet. Look for one that is age specific and doesn't have any added sugars. Make sure it also includes at least 400IU of vitamin D, which is the daily RDA. With the lack of year-round sunshine in the UK, it is important to keep your child's vitamin D levels up all year, as vitamin D is an important nutrient for building strong bones, helps to fight infections, keeps the heart healthy, and much more," Sulic advised.

Berry added: "I would also recommend a magnesium supplement; this mineral is especially crucial to children due to its contribution to health and development. An important co-factor for the formation of antibodies, which target invading pathogens, magnesium also helps children to fight off infections and illness, keeping them healthy. Due to the evolution of modern diets and lifestyles, it is increasingly important to monitor our children's nutrient intake, to maintain a strong immune system and ensure they can lead an active and healthy lifestyle. Taking tablets and following a supplementation plan can be a constant battle, so a great-tasting vitamin oral spray or topical mineral supplement may be the answer."

Gut health should also be considered.

"An age specific microbiotic is a very supportive supplement that will help to keep your child's gut bacteria in balance, boost their immune system and support their digestive system. Microbiotics can be taken daily as a maintenance tool and should always be taken for at least one month if your child had to take antibiotics," Sulic suggested.

Issom agreed, adding: "Bacteria within the digestive tract can be considered as the foundation for normal digestive functioning. Alterations in the type and amount of bacteria present within the digestive tract can contribute to symptoms such as constipation, diarrhoea and bloating. Additionally, without these bugs, immunity can become compromised, leaving us vulnerable to infections, food allergies, asthma, eczema and hay fever.

"Imbalanced gut bacteria have also linked with altering children's attention, behaviour and mood. Major contributing factors to low gut bacteria include antibiotics, stress, and poor diet. Therefore, replenishing these bacteria via probiotic supplementation could also be key in ensuring the health of children and young adults."

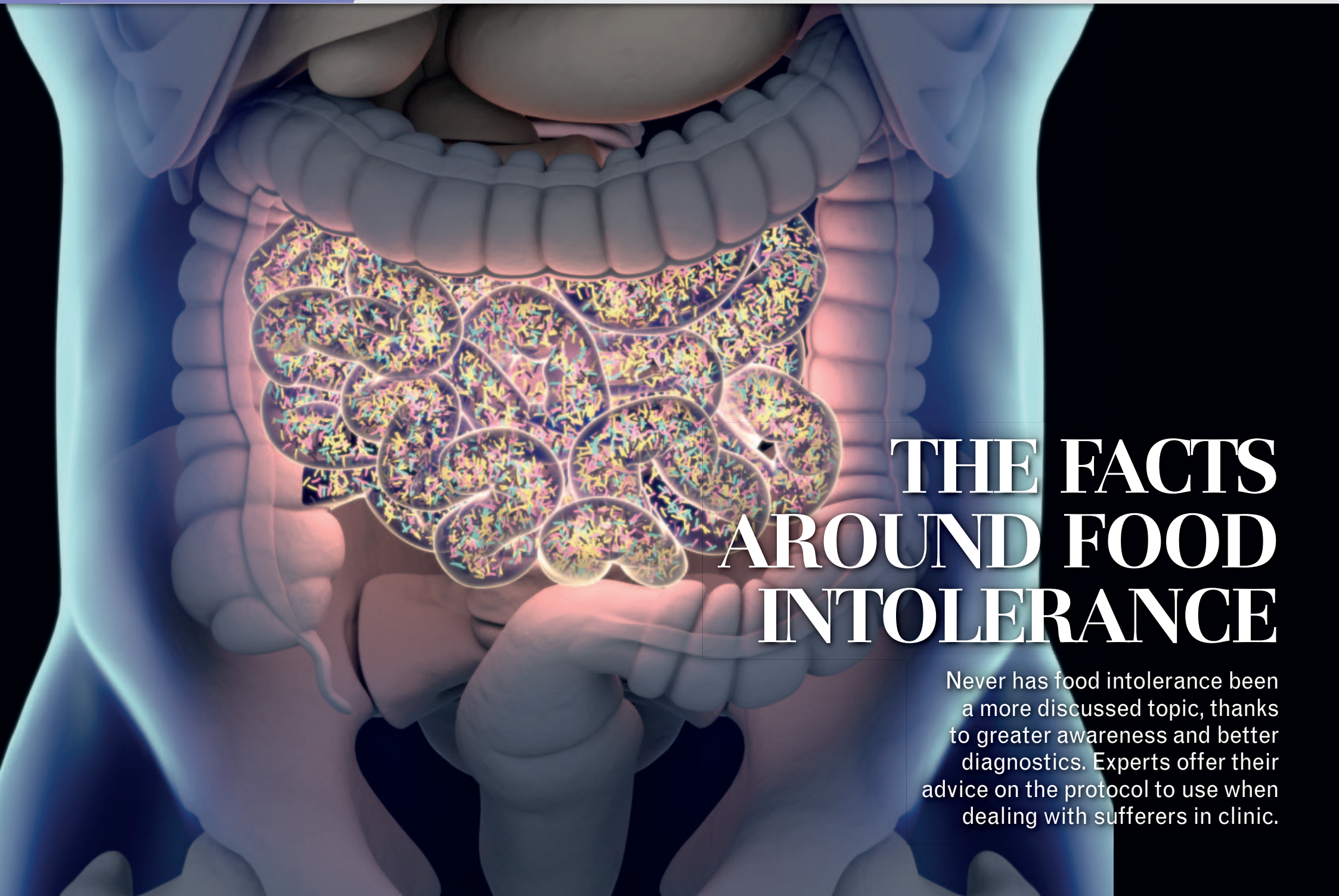
Berry added: "Folic acid assists growth and development in children, supporting healthy blood and immunity, while vitamin A contributes towards eye health, iron metabolism and immunity. Vitamin C helps skin health, while both C and D contribute towards healthy bones, teeth and immune system and finally, B vitamins are important for a healthy heart and blood,

hormonal activity regulation and cognitive function, as well as energy metabolism."

Issom also pointed out: "Iron is another nutrient commonly flagged as being particularly low within the childhood/adolescent population, particularly within adolescent females, with 54 per cent of children consuming iron at levels lower that the NRV, putting them at risk of deficiency. Low iron status can coincide with symptoms such as fatigue, shortness of breath, headaches and a pale complexion."

In terms of other lifestyle considerations, it's not just adults that need to stay active – being physically fit is imperative for children, and for so many reasons.

"Daily exercise is very important. This will help to stimulate their appetite, burn any excess calories and support their metabolism. It's all about balance and not making food a big issue. So, encourage your child to be active especially outdoors in the sunshine (a natural source of vitamin D) and try to limit their time in front of the computer or television," Sulic added.



THE FACTS AROUND FOOD INTOLERANCE

Never has food intolerance been a more discussed topic, thanks to greater awareness and better diagnostics. Experts offer their advice on the protocol to use when dealing with sufferers in clinic.

We are living in an age of food intolerances. Whether perceived or actually diagnosed, awareness around the potential effect certain foods can have on our health has never been higher. This has led to a massive hike in the number of people eliminating foods from their diet, with prevalence estimated to be rising by 50 per cent in the past few years.

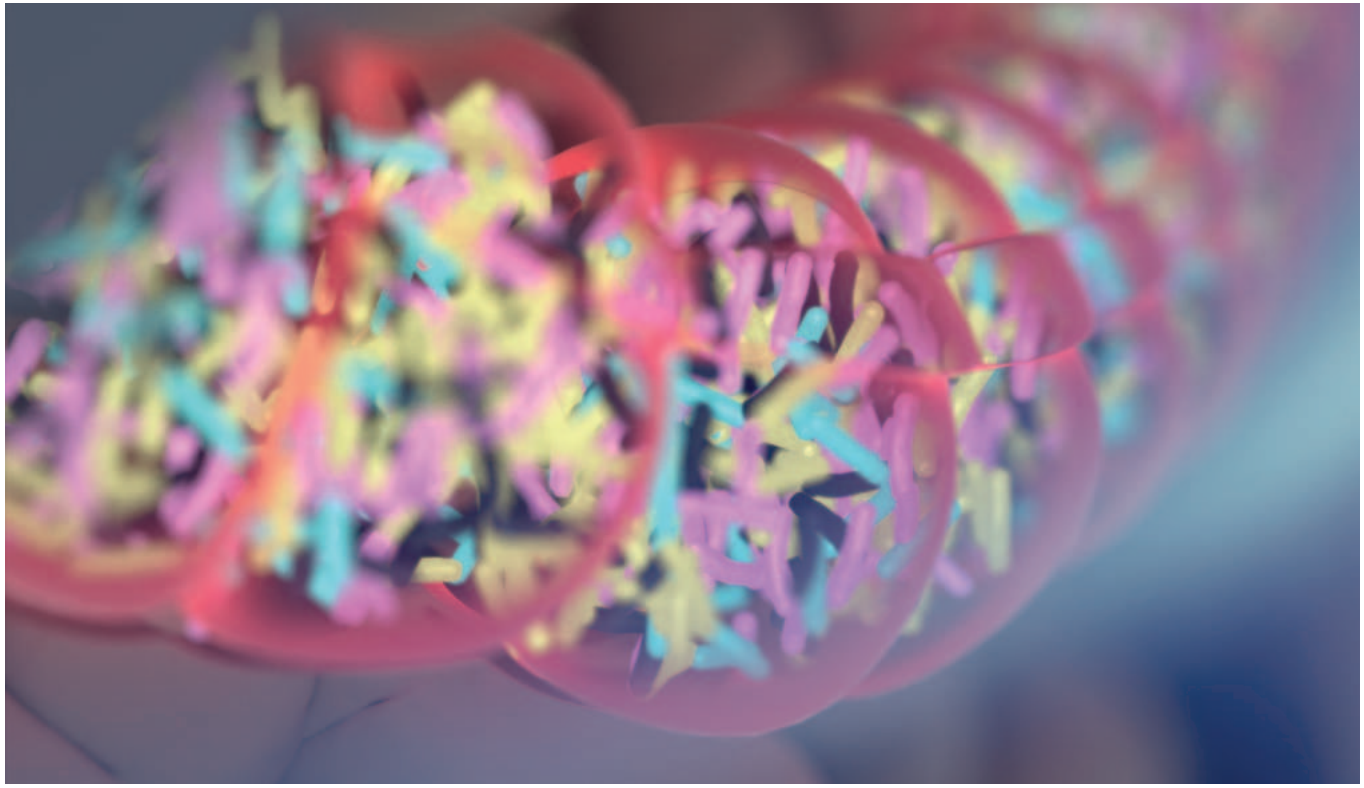
For those suffering with the effects of a certain type of food, seeking the advice of a Nutritional Therapist is a common choice, and with many advancements in diagnostics, there is much that can be done these days to help people live with an intolerance and to manage any associated health issues.

Amanda Pilkington, Director at Bionetics, advised: "According to the NHS, around one in five adults report to have a food intolerance and this figure could actually be higher, with unreported cases. It's a combination of more people suffering and that we are more aware but there is no doubt that the incidence of food related reactions is rising."

James White, speaking on behalf of KBMO Diagnostics, added: "Food sensitivity and related diseases affect at least 100m people worldwide. The prevalence of food sensitivities has increased more than 50 per cent in adults and children in the past few years.

"The growing number and prevalence is driven by things like the reduced quality of food in the food chain and the increased quantity of processed food being consumed. For example, gluten being put in sandwich meats and shampoos and skin creams is certainly going to have an impact. If you also look at some of the recent research showing the damage that colourings and additives are doing to intestinal permeability, that is another link with processed foods clearly having a negative impact."

He also pointed out that according to the National Institute of Allergy and Infectious Disease (NIAID),



there are additional groups of patients with food reactions, with approximately 12 per cent of the US population being diagnosed with reactions to food (IgE food allergies, food intolerances, coeliac disease, and non-IgE FA such as eosinophilic oesophagitis/ gastroenteritis)

IDENTIFYING INTOLERANCE

Issues with different foods can be problematic to advise upon, simply because there are many different symptoms, and different causes, that leads a person to have a react.

When it comes to food intolerance, there are differing types.

Richard Pilkington, fellow Director at Bionetics, explained: "It's a combination of factors which contribute to the onset of food intolerances. We all have some natural aversions to foods as many foods have been altered for mass production and this can make us more prone to be intolerant to them. Our immune systems may be compromised, which can lead to a rise in the reactions to foods and our own gut bacteria. This gut bacteria helps in breaking down foods and can often be compromised, which can also cause issues with foods.

"Reactions can vary from very severe, even death in extreme cases, to very low-level sensitivities to which we may not even be aware and can take days

to manifest. All of them affect us in some way and we should do our best to identify and avoid problem foods, also help build good immune and gut function with probiotics."

And White continued: "In the words of Dr Brent Dorval, 'A food sensitivity occurs when a person ingests food and the food antigens cross from the lumen of the gut into the bloodstream, and then cause the production of antibodies, IgG antibodies, which then precipitates the formation of immune complex, which then activates complement, and then causes the intended inflammation. Really, the important word here is inflammation because the immune complexes, when they activate complement, they cause inflammation and then that generates the symptoms that are associated with food sensitivities."

If we look at the types of foods you will most commonly see in clinic in terms of reactions, White advised that 90 per cent of sensitivities are in eight food groups; milk, soy, eggs, wheat, peanuts, tree nuts, fish, and shellfish.

Richard Pilkington advised: "Dairy, wheat (or grains in general, which is gluten intolerance), some nuts and seeds, tomato, potatoes and peppers, which are deadly nightshade family. Then a host of other foods which are in our daily diets. It is possible to be intolerant to almost any food, although obviously we tolerate most quite well."

And in terms of signs to spot, White commented: "Symptoms include a variety of illnesses, from skin rashes and headaches to chronic intestinal diseases. Delayed food sensitivities occur hours or days after food ingestion. Delayed food sensitivities are caused by IgG 1-4 and immune complexes that activate complement."

Amanda Pilkington continued: "Bloating, wind, cramps, tiredness, brain fog, eczema, and asthma are all symptoms of someone suffering from an intolerance."

White also explained the difference between symptom characteristics of IgE versus IgG; while IgE onset is rapid, duration is brief and patients are often aware, IgG is delayed by hours, it continues for a prolonged period (days) and patient awareness is rare.

ADDRESSING THE CAUSE

The question is, do experts believe there is a reason someone will suffer with a food intolerance, for example, genetics or age, or is it considered to be random?

"Genetics, epigenetics, state of immune and gut function all play a major role in intolerance. It's possible it's genetically encoded and this can give rise to severe allergic reactions. Epigenetically, it could be foods to which our ancestors had too much or too little exposure. Immune and gut function both play a role in the processing and handling of food proteins in the system. Both should be strong to minimise reactions to foods," Richard Pilkington explained.

It's really important here to analyse a person's nutritional status as food intolerance can be accompanied by less than desirable nutritional levels.

"It's important if you are avoiding foods to ensure that you get a balanced diet and nutritional intake. Using probiotics and nutritionals like green barley can help to keep up nutritional intake when combined with a balanced diet," Amanda Pilkington advised.

"Probiotics (natural wholefood) can really assist with the whole intolerance issue. Digestive enzymes can help too and making sure that for each removed food, one is added that replaces the nutrients missing from the removed food. A good acid/alkaline balance can help too. A person temporarily avoiding certain foods should bolster their diet with an appropriate supplement at a relevant dosage."

ASSESSING A CLIENT

There are many ways to analyse if a client is experiencing an issue with food, and these have moved on greatly from the earlier days of

simply filling out a food diary.

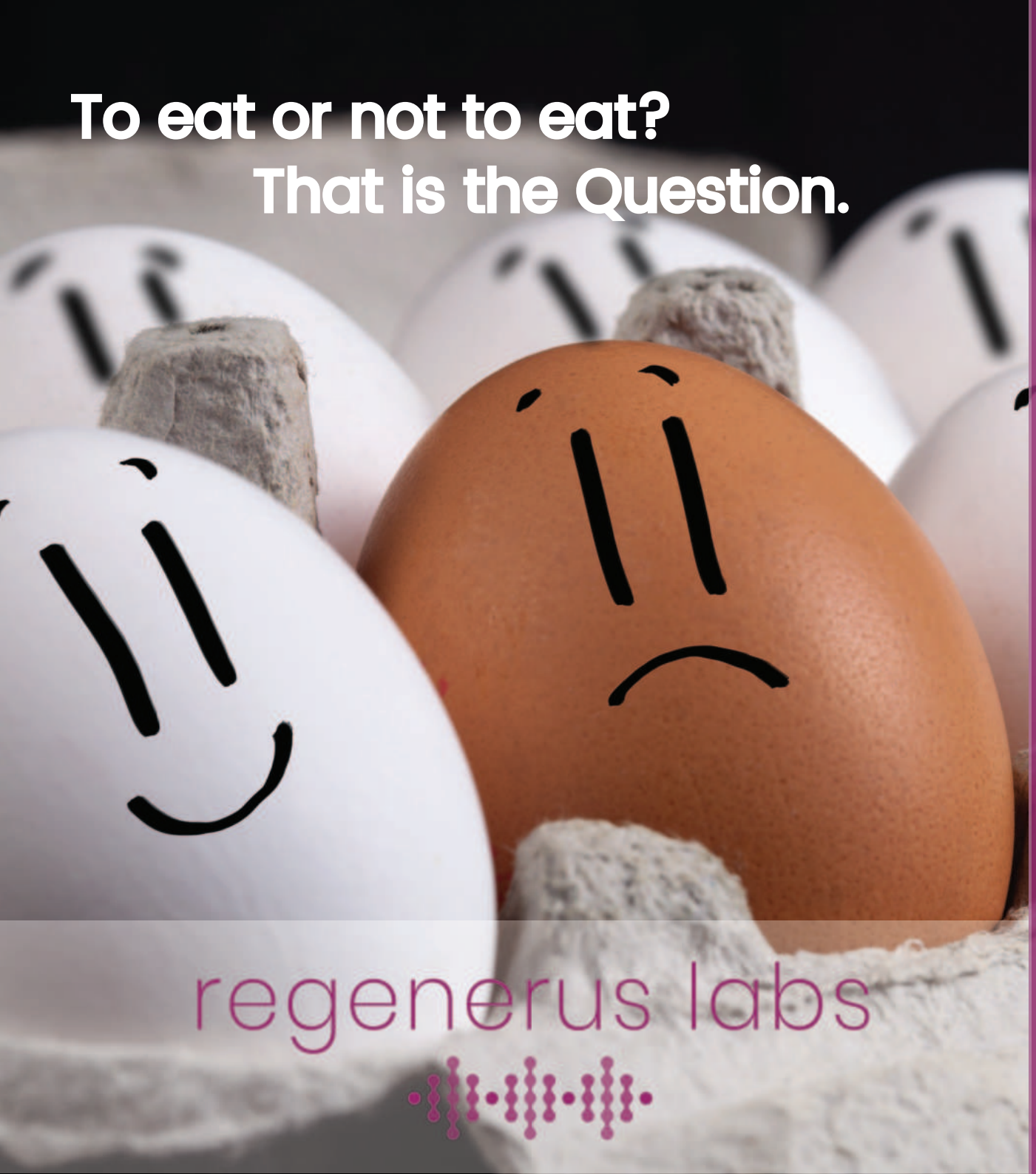
White advised: "In the past, people have looked at elimination diets and food diaries as ways of patients trying to identify which foods are causing them the symptoms they present with. For food sensitivities, in particular, given the delayed nature of up to 72 hours after the consumption of the food, this makes food diaries and elimination diets before you take into consideration patient compliance sometime problematic ways of identifying the offending foods colourings or additives."

So, what would be considered the most effective way to test?

White continued:

- **"IGG only:** Many IGG only tests which typically are limited by there being multiple reasons to have elevated IGG so normally cause false positives, which means compliance can be tough for patients when they are told to avoid 20 plus foods. The other issue can be IGG is measuring the part of the immune system which is looking at exposure so it can measure only the frequently eaten foods.
- **Cell-mediated tests:** In this category, you have ALCAT, which is looking at the swelling of lymphocyte cells, and MRT, which looks at the shrinking of lymphocyte cells. The tests are an indirect method and providers have mentioned not very reproducible and also present many false positives.
- **KBMO:** A direct method patented test invented by Dr Brent Dorval Phd MIT, who also invented the first rapid HIV diagnostics. It measures not only IGG but also complement activation via the marker C3d. The C3d is measuring the part of the immune system which measures inflammation, which is the underlying cause of many diseases. The multiple pathway approach of measuring IGG and C3d enables them to eliminate the false positives and zero in on the key foods of interest."

To eat or not to eat? That is the Question.



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THE APPLICATION OF MYCOTHERAPY

We have seen a rise in the use – and the body of research – of medicinal mushrooms. Given the breadth of health areas they relate to, experts discuss their appropriate use in clinic.

Mushrooms are pretty powerful, health-giving constituents, having been used for thousands of years in different cultures, yet it is only in more recent years that their application in western societies has become more widespread, referenced by the obvious rise in the number of brands on the UK market.

Perhaps why they are increasingly recommended is in light of the vast areas of health-related issues that they can be supportive of, making them a relevant consideration for you in-clinic.

"Mushrooms have been used in both Chinese and Japanese cultures for over 4,000 years and as research advances, the benefits of these magical foods are being appreciated all over the world. The term medicinal has been ascribed to these mushrooms due to their documented therapeutic and health-promoting properties," commented Alice Bradshaw, Head of Nutrition Education and Information at Terranova Nutrition.

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

Libby Limon, Nutritional Therapist at Link Nutrition, continued: "Medicinal mushrooms (MM) can be defined as macroscopic fungi that are used in the form of extracts or powder for prevention, alleviation, or healing of multiple

diseases, and/or in balancing a healthy diet. Medicinal mushrooms are growing in popularity for one main reason – they work! They have always been widely used in Asian medicine, used both as standalone treatments and in more recent history supporting mainstream medicine.

"As such a dominant influence on medicine in that part of the world, they have been extremely well researched in terms of risks and benefits. Globalisation does not just apply to economies but also knowledge. Hence, in recent years this knowledge and research has become more prevalent in western societies. As we learn more about their proven benefits, it makes sense they become more accessible and used more regularly."

Attila Föto, an experienced Mycologist at Hifas da Terra, which specialises in mushroom nutrition, added: "We already know that diet is a determining factor when it comes to maintaining health and, as scientific research progresses, we discover that the way we eat is directly related to the appearance of certain chronic diseases, as has been noted from FAO. In relation to fungi, they stand out for their value as food; they have a high content of water and few calories, they are a source of natural proteins of non-animal origin, they are high in fibre and depending on their substrate, could be useful sources of trace elements, minerals etc.

"But fungi are also fascinating repositories of nutrients and active compounds that may provide many positive health benefits for humans. A single specimen may contain hundreds of beneficial substances that are really interesting from an integrative health and medicine perspective."

MYCOTHERAPY EXPLAINED

In terms of the market, there is far greater interest in the area of mushrooms for health, but what exactly does mycotherapy constitute?

Föto explained: "Mycotherapy focuses on the research and development of mushrooms as nutritional supplements for the prevention, maintenance and improvement of both human and animal health. Fungi are one of the most important therapeutic arsenals of the natural world. Each fungal species consists of hundreds of active molecules, such as polysaccharides (including ß-glucans), di- and triterpenes (including sterols), phenols, peptides, proteins, polysaccharide-protein complexes, etc.

"Modern science has discovered in mushrooms, many health-promoting qualities, including lipid-lowering, immunomodulatory, anti-tumour, antioxidant, anti-viral, antibacterial, anti-parasitic, hepatoprotective, anti-diabetic and more."

Dani Binding, from Specialist Supplements, which has a number of mushroom products in its portfolio, continued: "Certain natural foods, which contain components that affect a particular bodily function in a positive manner, are sometimes referred to as functional or medicinal foods. This concept is linked to the development of a relatively new scientific discipline, which recognises and investigates the relationship between diet and disease.

"Several thousand years ago, it was recognised that many edible (and some non-edible) mushrooms could have valuable health benefits. With this in mind, medicinal mushrooms are simply mushrooms with medicinal properties that are beneficial for health. For example, mushrooms are found to be good source of vitamins (particularly thiamine (B1), riboflavin (B2) niacin, biotin, and ascorbic acid (vitamin C), as well as antioxidants, triglycerides, sterols and phospholipids."

She added: "The growing awareness of functional food among consumers has created a booming interest in medicinal mushrooms and their potential health applications, because of their extraordinary nutritive and medicinal properties. In this modern age of ever-increasing time pressures, stress, pollutants, toxins and other immune system and nervous system stressors, the average health-conscious individual is looking for a natural means of supporting their immunity, general health and wellbeing, as well as boosting their longevity.

"Belonging to the taxonomic category of basidiomycetes or ascomycetes, these mushrooms are particularly notable for their antioxidant, anti-microbial, immunomodulatory, hepatoprotective, anti-nociceptive, anti-diabetic, anti-viral, and anti-microbial properties."

HEALTH-GIVING PROPERTIES

Specific mushrooms are useful for different health areas, with the key ones being reishi, cordyceps, maitake, shiitake and chaga.

"There are more than 130 medicinal functions produced by MMs and fungi. Each individual species has its own 'specialty' in terms how it can support the body's wellbeing, anything from mood health to digestion. However, their common theme is that

they support the immune system, they can help fight inflammation, microbial or viral infection, the growth of tumours, and autoimmune reactions," Limon advised.

Binding continued: "As an increasing body of research backs up claims of immune system support, increased stamina, mood enhancement and longevity, medicinal mushrooms are being recognised as being more than just the latest health fad, and, therefore, the market for mushroom supplements is set to rapidly grow.

"And, in this age of growing environmental concern, it is worth noting that mushrooms are little eco-warriors in their own right. Medicinal mushrooms have the ability to absorb and decompose compounds in the soil around them, including toxic waste (such as petroleum and some pesticides). Mushroom mycelium also plays a vital role in helping to maintain the ecosystem by decomposing plant material and providing a food source for insects."

And Föto added: "We talk about fungi, in general, having bioactive compounds such as phenols, proteins, ß-glucans, di- and triterpenoids, etc. Each of these substances can act at different levels; modulation of the immune response, control of blood glucose levels or histamine release, regulation of cholesterol synthesis and absorption, acting as protectors of liver and kidney function, as regenerators of mucous membranes or neurons, etc.

"Fungal species such as lion's mane (*Hericium erinaceus*) and shiitake (*Lentinula edodes*) are studied in the neurocognitive development and the synergy of reishi and cordyceps has been shown to reduce the athlete's overtraining syndrome in professional cyclists. It has even been observed (*in vitro*) that fungal species such as maitake (*Grifola frondosa*) and turkey tail (*Trametes versicolor*) can limit the progression of metastasis in colorectal cancer, compromising the growth and development of tumour cells."

Here, we look in closer detail at the benefits from the individual mushrooms.

REISHI

"Traditionally known as the mushroom of immortality or eternal youth, it is ideal for stress and anxiety if taken in the day. Equally, it can be taken before bed to help with insomnia. It has also been shown to be helpful for heart health too," Limon advised.

Bradshaw added: "The polysaccharides, ganoderma A, B, C found in reishi have been shown in studies to have blood sugar lowering effects via several mechanisms, including increasing plasma insulin and decreasing plasma sugar levels. Triterpenes are also present in reishi and ganoderic acid has been shown in studies to ease the symptoms of allergies by inhibiting the release of histamine. Research has shown benefits in the areas of immune health, inflammation, pain relief, liver health and allergies. Reishi has also demonstrated antiviral and antibacterial properties.

MAITAKE

"Numerous research studies have highlighted several significant health benefits associated with compounds in maitake mushroom," Bradshaw advised. "Like other medicinal mushrooms, maitake contains many potent elements and is especially rich in ß-Glucans (beta-glucans), a group of ß-D-glucose polysaccharides, which have been scientifically shown to support the immune system by enhancing macrophages and natural killer cell function.

"Maitake mushrooms are especially rich in the sulphur-containing antioxidant, ergothioneine. This unique compound produced by fungi has been shown to have strong antioxidant properties and to provide cellular protection within the human body. There is also research to support the anti-inflammatory action of ergothioneine. Research supports maitake's role in supporting healthy blood pressure, cholesterol and blood sugar levels. Maitake is also considered an adaptogenic agent, helping the body to adapt to physical, emotional and environmental stressors."

Binding went on: "Maitake means dancing mushroom in Japanese. It is said to have gotten its name after people danced with happiness upon finding it in the wild, such are its incredible healing properties. It grows wild in parts of Japan, China, and North America, at the bottom of oak, elm, and maple trees.

"Maitake is a type of adaptogen. Adaptogens assist the body in fighting against any type of mental or physical difficulty. They also work to regulate systems of the body that have become unbalanced. Although maitake mushrooms have been used in Japan and China for thousands of years, it has only gained in popularity in the United Kingdom and United States over the last 20 years, as it has received more wide-

spread recognition for its benefits for health, vitality, and longevity.

"Maiitakes also help to boost immunity (they are rich in antioxidants, beta-glucans, vitamins B and C, copper, potassium, fibre, minerals and amino acids. They are also fat free, low-sodium, low-calorie and cholesterol free), help to lower cholesterol and help to normalise blood sugar levels."

CHAGA

Antioxidant-rich, Bradshaw recommended: "Chaga mushrooms contain one of the highest ORAC (Oxygen Radical Absorbent Capacity) scores of any food. As such, their high antioxidant potential means they effectively protect the body from harmful free-radicals. The active constituents within chaga include a combination of triterpenes, such as betulinic acid, sterols, and polysaccharides. Chaga has been the subject of numerous scientific studies which support its actions as an antioxidant, cell-protective, immune enhancing, anti-viral, anti-inflammatory and endurance-enhancing agent."

Limon continued: "Chaga is great for supporting the immune system, reducing inflammation and protecting cells from mutation. It is commonly drunk as a tea, so it can easily substituted in for one of your daily hot drinks."

CORDYCEPS

Perhaps one of the better known and more widely used mushroom, cordyceps boast a range of benefits.

"Cordyceps mushrooms have long been esteemed for their potent health-promoting qualities, especially their anti-ageing and energy-enhancing properties. Rich in antioxidants, enzymes and vitamins, cordyceps has been used in Chinese medicine to support numerous health systems, including the kidneys and cardiovascular system," Bradshaw advised, adding: "The studied health benefits of cordyceps include enhancing immune function (there's research suggesting immune-regulating properties, meaning that it may play an important role in the management of autoimmune conditions), slowing the ageing process, improved athletic performance, blood sugar regulation, renal and cardiovascular support."

Föto added: "Cordyceps is one of the most popular natural remedies of traditional Asian medicine and is only consumed for its health benefits: Fatigue – cordyceps properties increase energy production and recovery after illnesses. Particularly helpful in conditions with prominent symptoms of fatigue and sports performance; improves fertility – unique composition of cordyceps increase sexual appetite and fertility. It is considered a powerful aphrodisiac; immunity – compounds within cordyceps balance the immune system; kidney health – cordyceps is effective in improving conditions relating to kidney function; and respiratory function – medicinal properties of cordyceps work to improve lung function and breathing. Useful in conditions such as asthma, bronchitis and COPD."

SHIITAKE

Binding placed the focus on shiitake as a key recommendation.

"Shiitake mushrooms are members of a special group of medical fungi that have been used in Japan and South East Asia from over 1,000 years. They contain a number of beneficial compounds (such as lentinan – a beta-glucan), which protect cells from oxidative damage. Eritadenine substances help reduce cholesterol levels and support cardiovascular health," she explained.

"Shiitakes are also unique because they contain all eight essential amino acids, along with linoleic acid (an essential fatty acid). Linoleic acid helps with weight loss and building muscle. It also has bone-building benefits, improves digestion, and reduces food allergies and sensitivities.

"Shiitakes also help to fight infection (by producing interferon, a group of natural proteins that stops viruses from multiplying), help to fight obesity (certain components of the shiitake mushroom have hypolipidaemic (fat-reducing) effects, such as eritadenine and ß-glucan, a soluble dietary fibre that is also found in barley, rye and oats), support immune function (by way of providing important vitamins, minerals and enzymes), have antimicrobial properties, and boost energy and brain function (shiitake mushrooms are a great source of B vitamins, which help support adrenal function and turn nutrients from food into useable energy. They also help balance hormones naturally and break through brain fog to maintain focus — even improving cognitive performance)."

And Bradshaw continued: "The medicinal properties of shiitake mushroom are attributed to an extensively-researched polysaccharide (sugar molecule) named lentinan. Lentinan (also known as beta 1,3 glucan) has been shown to enhance a number of aspects of the immune system. As such, it's been shown to kill viruses and microbes and offer powerful

cell-protective capabilities."

SHAGGY INKCAP

"Shaggy inkcap (*Coprinus comatus*) is a very unique mushroom and interestingly one of the few medicinal mushrooms whose effects were not discovered by Traditional Chinese Medicine (TCM), but European," Föto explained.

"Four powerful benefits of *Coprinus comatus* are: Obesity – medicinal properties have been studied in cases of obesity and metabolic problems; blood glucose levels – *Coprinus comatus* contains a natural compound that mimics insulin, making this mushroom excellent for balancing blood sugar levels; diabetes – active compounds of *Coprinus comatus* helps to recover the pancreas in cases of diabetes and regulate insulin levels naturally; and circulation – this mushroom improves blood circulation which, in turn, positively affects the health of arteries."

LION'S MANE

The lion's mane (*Hericium erinaceus*) is popular in China and Japan, and stands out for its high fibre, high protein and natural prebiotic content.

Föto advised: "Five powerful benefits of lion's mane mushroom are: Balances the microbiota – properties of lion's mane protects and supports healthy gut bacteria, important with any condition affecting digestion; digestive health – lion's mane compounds act to support inflammation of the gut and a wonderful mushroom to help with conditions affecting digestion, the bowel, allergies and food intolerances, and particularly useful for people with Crohn's disease and ulcerative colitis; neurodegenerative diseases – compounds have powerful regenerative actions, making lion's mane the go to mushroom for supporting nerve related conditions; cognitive impairment – bioactive compounds in lion's mane protect nerves to help enhance memory, for instance in dementia and Alzheimer's; and reduces peripheral neuropathies – for example, weakness, numbness, sensitivity and pain, usually in the hands and feet."

And Binding added: "Lion's mane mushrooms are large, white, shaggy mushrooms that resemble a lion's mane as they grow. They have both culinary and medical uses in Asian countries like China, India, Japan and Korea. These mushrooms contain bioactive substances that can have beneficial effects on the body, particularly the brain, heart and gut.

Lion's mane mushrooms can also help to protect the brain (the brain's ability to grow and form new connections typically declines with age. Studies have found that lion's mane mushrooms contain two special compounds that can stimulate the growth of brain cells, hericenones and erinacines). They can help to relieve mild symptoms of depression and anxiety (up to one third of people living in developed countries experience symptoms of anxiety and depression. While there are many causes of anxiety and depression, chronic inflammation could be a major contributing factor).

"They support recovery from nervous system injuries. These components work together to send and transmit signals that control almost every bodily function. Research has found that lion's mane mushroom extract may help speed recovery from these types of injuries by stimulating the growth and repair of nerve cells and help to protect the digestive tract. Lion's mane extract may protect against the development of stomach ulcers by inhibiting the growth of *H. pylori* and protecting the stomach lining from damage. It can also reduce inflammation and prevent tissue damage in other areas of the intestines and therefore may help treat inflammatory bowel diseases like ulcerative colitis and Crohn's disease)."

ROYAL SUN AGARICUS

Föto advised: "Four powerful benefits of royal sun agaricus are: Immune system – it has exceptional properties to improve the natural immune response. This mushroom is the best friend for any condition relating to immune health, such as autoimmune disorders and allergies; anti-allergic – unique compounds in this mushroom are very useful for histamine related allergies; infections – compounds in royal sun agaricus strengthens the body's defence barriers towards infections; and liver support – it contains active compounds that work to protect liver function and help liver recovery."

QUALITY CONTROL

There are differing levels of quality when it comes to medicinal mushrooms, not to mention different applications in terms of use.

This is an area of importance when it comes to Nutritional Therapists and the recommendations they make.

"We would suggest bearing the following factors in mind when making a recommendation: The customer will almost certainly have a particular health goal in mind, or ailment they wish to improve. It is clearly essential to pick the right mushroom, or combination of mushrooms, to support those beneficial outcomes; budget and end-results are usually the two primary concerns for customers," Binding advised. "As

such, choosing a single combination supplement that has a selection of medicinal mushrooms and synergistic herbals can offer greatest efficacy and value for money; linked to the point above, choosing a supplement that contains other synergistic ingredients, which support (for example) the absorption and utilisation of the mushroom nutrients. A perfect example is black pepper (*Piper nigrum*), which not only acts as anti-inflammatory agent in its own right but can also increase the absorption and utilisation of the beneficial mushroom nutrients."

There is consideration to make around ingredients, with freeze drying being a useful consideration.

"When choosing mushroom supplements, therapists should understand the processes used in manufacturing. Air, oven and spray drying – the standard commercial methods used to dry plant materials – can degrade important compounds and alter a plant's delicate biochemical balance. On the other hand, research shows that fresh freeze-drying actually protects and retains a plant's potency, biochemical integrity and enzymatic activity," Bradshaw advised.

"In fact, the biochemical profile of a fresh freeze-dried plant very closely resembles the profile of the original fresh plant, but in a much greater concentration, due to the removal of the plant's moisture content. Additionally, it's advantageous to select products that are derived using 'full-spectrum' raw material, which provide complete fungal composites from all stages of the mushroom's development. The biologically active compounds found with full-spectrum fungal ingredients include the mycelium, primordia, fruitbodies, as well as extra-cellular compounds that are responsible for known medicinal properties found in fungi."

And the way the mushrooms are grown is also a consideration, with Föto advising: "Another of the relevant quality criteria is organic production. Fungi are great bioaccumulators, which means that they are able to capture a lot of health-promoting substances from the culture medium, but if they are not organic, they could also pick up pesticides, heavy metals, hydrocarbons, etc. with the consequent risk of health. Another, not less important question, is to control the absence of additives, dyes and other unnecessary ingredients for the effectiveness of the formulas."

Recommending the correct usage is also of importance, Limon explained, adding: "Dose is important, between 1g and 3g per day if medicinal mushroom. Also, different mushrooms have their active compounds in different parts of the mushroom so having a quality brand that values giving you the best quality product is important to get mushrooms that work effectively. Like all supplements, they need to be stored correctly away from sunlight in a blacked out jar in order to protect them from spoiling through oxidisation."

EMERGING RESEARCH

Medicinal mushrooms is an area of focus when it comes to research and we are seeing an increasing body of evidence.

"There are very recent studies of 2018 that demonstrate the anti-tumour activity in cell lines of certain fungal extracts. These results, obtained from the European FungiTechOnco R&D project, have been included in the article *In vitro* Anti-proliferative and Anti-invasive Effect of Polysaccharide-rich Extracts from *Trametes versicolor* and *Grifola frondosa* in Colon Cancer Cells, recently published in the *International Journal of Medical Sciences*," Föto commented.

"In addition to the anti-tumour activity, it has been demonstrated that extracts rich in polysaccharides inhibit the ability of migration and invasion of other tissues, acting thus on the cellular changes identified with the metastatic process. Another project in development, called Micromarker, is evaluating the prebiotic and anti-inflammatory action of some medicinal species on the microbiota and how the alteration of the intestinal bacteria community can alert on the development of colorectal cancer.

"In the neurological field, the evidence collected on alpha-linolenic acid, vitamin D and vitamin B12, compounds present in fungi, such as lion's mane, shiitake and reishi, has shown positive effects on neurological diseases."

Limon continued: "A lot of the research is based around supporting cancer therapies(1). However, showing that mushrooms can be great for more everyday support that is wide ranging across our wellbeing needs, such as for improving sports performance (3), maitake may be good to take as prophylactic against winter 'flu and colds (4) and mushrooms support our brains and mental health (5,6)."

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EXPERT ADVICE

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

CLICK HERE FOR REFERENCES

Q When investigating a client presenting with potential leaky gut, what is the recommended protocol for assessing if they are experiencing it, and the initial recommendations to bring it under control?

AICACIA YOUNG ADVISED: Leaky gut is a condition characterised by increased intestinal permeability, and some research suggests that it may very well be ground zero for many chronic diseases.[1]

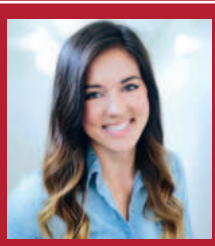
When considering whether or not a patient has a leaky gut, it's important to look at the whole picture. Does the patient have allergies, sensitivities, diagnoses, or any chronic symptoms? Has the patient ever travelled out of the country or taken antibiotics? It is estimated that about 33 per cent of the Western population has leaky gut due to a variety of factors.

Some of the basic lifestyle factors that contribute to leaky gut include chronic alcohol consumption, chronic smoking, intense exercise, lack of sleep, and overuse of medications like antibiotics, non-steroidal anti-inflammatory drugs (NSAIDs), and proton-pump inhibitors (PPIs).[2] However, one of the major contributors to overall gut dysfunction is stress.[1,3] These findings suggest that stress management could be particularly effective in the treatment of digestive and autoimmune conditions. Additionally, researchers concluded that "probiotics may profoundly affect the gut-brain axis and attenuate the development of stress-induced disorders in the upper and lower GI tract[4]".

Some basic lifestyle choices, such as managing stress, limiting alcohol, and getting adequate sleep, can all significantly reduce the risk for developing leaky gut. However, since most people already have leaky gut to some degree, there are also some promising interventions.

- **Increase secretory IgA levels:** Secretory immunoglobulin A (sIgA) is the first line of defence against toxins in the intestines because it has the unique capability of binding and neutralising toxins directly in the lumen. Nutrients that can increase sIgA levels include omega 3 fatty acids, glutathione, glutamine, glycine, vitamin C, and zinc.
- **Increase mucin production:** Another way to strengthen the intestinal lining is to thicken the protective mucosal barrier known as the mucous layer that rests on top of it. Nutrients that can increase mucin production include threonine, serine, protein, and cysteine.
- **Modulate the microbiome:** The major concern with most probiotics is the issue of survivability. Most probiotic strains are not designed to withstand stomach acid, bile salts, or the competitive environment in the large intestine. For this reason, most probiotics fail to make any lasting changes to the gut microbiome or have any protective effects on the host. However, spore-based probiotics are uniquely designed to survive digestion and compete in the large intestine with ease. For these reasons, spore-based probiotics are some of the most promising leaky gut treatments on the market today. In fact, a recent study conducted at the University of North Texas found that just 30 days of supplementation with MegaSporeBiotic demonstrated a 60 per cent reduction in leaky gut biomarkers without any additional interventions.[5] To date, bacterial spores are the only probiotic strains that have been shown to reduce leaky gut.

THE EXPERT



Aicacia Young, RDN is Director of Scientific Affairs at Microbiome Labs and 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.

Q Can you detail the role that polyphenols play in our cognitive function and identify what the latest research is telling us?

CHRISTIE NEWMAN EXPLAINED: When it comes to the role polyphenols have on cognitive function, recent research has demonstrated their beneficial effects go further than just reducing oxidative stress (Cox and Scholey, 2016).

Firstly, much research into their bioavailability suggests that their metabolites demonstrate the ability to pass through the tightly regulated blood brain barrier (BBB) (Abbott et al., 2010; Figueira et al., 2017a). In *vitro* and *vivo* studies reveal certain polyphenols have higher levels of permeation, that their uptake and distribution within the brain are well documented and they are suggested to do this more efficiently than any other dietary compounds (Campos-Bedolla et al., 2014).

Further, the growing body of evidence into their mechanisms of action within the brain suggests they aid many cellular processes involved in the production of specific proteins which support the formation, proliferation and lifespan of neuronal cells and exhibit a strong potential to counteract neurotoxicity by reducing neuroinflammation (Almeida et al., 2016; Castelli et al., 2018).

Although rather complex, the main anti-inflammatory properties of polyphenols in relation to reducing neuroinflammation are their ability to inhibit the release of cytokines and reduce nitric oxide production, which, in turn, downregulates the pro-inflammatory transcription factors. This is suggested to support cognitive health by preventing the production of chemical imbalances, which act as a trigger to the naturally occurring brain age deterioration process (Spencer et al., 2012; Vauzour, 2012). The brain area most susceptible to this is the hippocampus, which is responsible for the neurological processes that support memory and learning (Dhikav and Anand, 2012). Therefore, common signs of a declining cognitive function are associated with the weakening of these skills and why they are often used as a benchmark to understand the levels of cognitive health – the more recent research explores specifically which polyphenols can help this core area.

Over the recent decades, epidemiological research exploring the link between diet, lifestyle and cognitive health has often found low polyphenol intake shows an increased risk of cognitive related disease (Petersson and Philippou, 2016). For example, a study published in the *Journal of Neurology* suggests a diet containing polyphenol-rich foods may reduce the risk of dementia (Lefèvre-Arbogast et al., 2018). The large French prospective cohort carried out across three cities consisted of 1,329 adults aged ≥65 years, who were free from dementia at baseline, found those who consumed particular polyphenols showed a decreased trend in rates of dementia over a 12-year period. The design of this study enabled researchers to further focus on the 26 main polyphenol classes and subclasses pulled from the findings, which allowed a deeper observation through multivariate models on the specific polyphenol compounds consumed. These combinations consisted of flavonoids, stilbenes, lignans and other subclasses, which demonstrated participants in the higher versus lower quintile of pattern score had a 50 per cent lower dementia risk (95 per cent CI, 20 per cent-68 per cent; P <.01) (Lefèvre-Arbogast et al., 2018). However, a potential limitation of this study is the use of 24-hour dietary recall, which may have been prone to error.

Longitudinal analyses of nutritional intake across populations like this supports additional research that seeks to answer the question, specifically, which polyphenols and at what dosage is required to reach the targeted tissues? Hence why more recently we are seeing the rise in in *vivo* human studies focusing on the potential capabilities of polyphenol supplementation to act as a functional ingredient on the memory and learning process, using cognitive assessments such as the CANTAB or RAVLT (Bensalem et al., 2018; Whyte et al., 2018; Figueira et al., 2017b).

To summarise, the latest research suggests polyphenols can indirectly promote the density of neurons, which, in turn, supports transference of chemicals containing messages to aid the several neurological processes involved in the overall cognitive function. Epidemiological research suggests their absence from the diet may increase the risk of cognitive related disease and investigation into which variety and quantity is best suited to uphold any beneficial impact continues to be explored.

THE EXPERT

Christie Newman is a researcher in nutrition and food policy, specialising in nutritional supplements/nutraceuticals. After receiving her first class honours undergraduate degree in Applied Food and Nutrition BSc from University College Birmingham, where she is a regular guest speaker in food and nutrition related subjects, Christie is now studying a MSc in Food Policy at City University London, whilst working as Nutrition Manager for elénzia. A key role of Christie's within elénzia is to review technical information and design effective, innovative nutritional solutions to support health, beauty and wellness

Q Can you detail the role of nucleotides in protein synthesis?

DR PETER KÖPPEL ADVISED: Nucleotides are the body's special nutrients that are the building blocks to our genes, since the body uses them to build the genetic material known as DNA and RNA in newly forming cells (for example, gut lining cells, bone marrow cells and muscle cells), and also in RNA. This is a crucial molecule that the body uses to carry messages and transport the amino acids to where they are needed for the formation of protein and repair of muscle.

Enzymes in the stomach and small intestine break protein apart to form peptides, which are chains of amino acids, and then further down to single amino acids. Likewise, a range of enzymes break down nucleoproteins into nucleic acids and then into nucleotides, prior to them being absorbed through the gut as a nucleoside.

In order to synthesise a protein, genetic information encoded in DNA needs to be converted from nucleotide sequence to the language of amino acids. The process of the decoding is called 'translation' and involves the Messenger RNA (mRNA) – the temporary carrier of the information.

- The building blocks of RNA are the nucleotides purines (adenosine, guanosine) and pyrimidines (cytidine and uridine).
- The building blocks of DNA are the nucleotides purines (adenosine, guanosine) and pyrimidines (cytidine and thymine).

DNA acts like a building site foreman; it calls up specific amino acids and directs their deployment. RNA acts as the messenger for the DNA and takes the protein blueprint to the active site in the body. Amino acids and nucleotides are stored handily in local stores. The nucleotides from these nucleotide pools are used to create new RNA required for protein synthesis.

Protein synthesis is basically dependent on nucleotide molecules, DNA, mRNA, tRNA, ribosomes, ATP and GTP. So, protein formation and mainly a rapid protein synthesis are depending strongly on the availability of nucleotides.

As a recap, the first step of the protein synthesis is the transcription of the information from the DNA on the mRNA. The mRNA leaves the cell nucleus and attach on ribosomes. The tRNA transports the amino acids to the binding site on the mRNA. The linkage of the amino acids needs energy, which is provided by ATP (adenosine triphosphate), which is a nucleotide derived molecule. So, this makes it clear that the availability of nucleotides is crucial for protein synthesis. A shortage of nucleotides, for example, ATP or GTP, reduces protein synthesis and the body switches the nutrients from food down the pathway, leading to fat formation.

Insufficient dietary intake of these nucleotides reduces the ability of the liver to produce protein, and where liver function is impaired then the storing of fat is favoured.

THE EXPERT

Dr Peter Köppel has a PhD in Biochemistry and Immunology. He was trained in biochemistry, with a special interest in clinical immunology, at the Institute of Virology at the University of Zürich. He then worked as a researcher in osteoarthritis and osteoporosis in a pharmaceutical company. For over 20 years, Dr Köppel led the research and production of specialised naturally extracted nucleotide ingredients, conducting over 400 trials for animal and human health. This led him to being recognised as one of the world's foremost experts on nucleotides for health and performance.

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Focus on VITAMIN B6

Understand the various forms of vitamin B6, and its use in practice. By Nutritional Therapist, Hannah Braye.

Vitamin B_6, also known as pyridoxine, was first discovered in 1932 by the Japanese scientist, S. Ohdake, and has since been shown to be a crucial compound for cellular metabolism.[1] The wide-ranging approved EFSA Art.13(1) Health Claim attaching to the vitamin give an indication of its importance to human health. These include 'contributes to the normal functioning of the nervous system', 'contributes to normal homocysteine metabolism', 'contributes to normal psychological function', 'contributes to the reduction of tiredness and fatigue' and 'contributes to the regulation of hormonal activity'.[2]

FORMS

Vitamin B_6 comprises a group of six chemically related compounds that all contain a pyridine ring as their core. They differ from each other in a variable group at the pyridine's 4' position, which can either be an amino methyl group, a hydroxyl methyl group, or an aldehyde. Once the different derivatives are phosphorylated, they can function as co-factors, with pyridoxal 5'-phosphate (PLP) being the biologically active form of vitamin B_6.[3]

MECHANISMS OF ACTION

Vitamin B_6 is implicated as a co-factor in more than 140 biochemical reactions in the cell,[4] largely due to its water solubility and high reactivity when phosphorylated, making it a suitable co-factor for many biochemical processes.[1]

Some of its key mechanisms of action are discussed in this article.

SUPPORTING METHYLATION

Vitamin B_6 is an essential homocysteine re-methylation co-factor, and deficiency is associated with increases in blood homocysteine levels.[5] Homocysteine is a risk factor for cardiovascular[6] and cerebrovascular disease,[5] as well as conditions such as migraine.[7] Reducing homocysteine levels via pyridoxine supplementation has shown therapeutic benefit. For example, researchers observed that women in the highest quintile of vitamin B_6 intakes from both food and supplements had a 34 per cent lower risk of coronary artery disease compared to those in the lowest quintile.[8] In addition, a 2015 double-blind randomised clinical trial conducted on 66 patients with migraine with aura found that pyridoxine supplementation led to a significant decrease in headache severity, attack duration and headache diary result (HDR) compared with placebo.[9]

Other studies have also noted beneficial effects of pyridoxine supplementation alongside vitamin B_{12} and folate, for reducing homocysteine levels, with subsequent associated benefits for migraine.[10,11]

INFLAMMATION

Low vitamin B_6 status may also increase the risk of conditions such as cardiovascular disease and migraine through mechanisms independent of homocysteine regulation. Serum C-Reactive Protein (CRP) concentrations have been observed to be inversely related to total vitamin B_6 intakes (from food and supplements), indicating that low vitamin B_6 intake may be a risk factor for inflammation and the occurrence of inflammatory diseases.[12]

ANTIOXIDANT CAPACITY

It was only fairly recently that the potent antioxidant ability of vitamin B_6 was recognised.

Research has shown that the vitamin is highly efficient in quenching reactive oxygen species with a similar potential to that described for carotenes and tocopherols.[1] In addition, vitamin

B_6 may indirectly play an antioxidant role by serving as a coenzyme in the glutathione antioxidant defence system.[13]

HORMONE REGULATION

Steroid hormones, such as oestrogen and testosterone, exert their effects in the body by binding to steroid hormone receptors in the nucleus of target cells.[14] Studies have uncovered a mechanism by which vitamin B_6 appears to affect the activity of steroid receptors and decrease their effects on gene expression.[15]

It is perhaps B_6's interaction with steroid hormone receptors which is responsible for the beneficial effects often seen with supplementation in hormonal conditions, such as pre-menstrual syndrome (PMS).[16] If the activity of steroid receptors for oestrogen, progesterone and testosterone can be inhibited by vitamin B_6, it is also possible that vitamin B_6 status may influence one's risk of developing diseases driven by steroid hormones, such as breast and prostate cancers.[14]

NEUROTRANSMITTER SYNTHESIS

In the brain, vitamin B_6 dependent enzymes catalyse the synthesis of two major neurotransmitters, serotonin and dopamine. Other neurotransmitters, including glycine, D-serine, glutamate, histamine, and y-aminobutyric acid (GABA), are also synthesised in reactions catalysed by B_6 dependent enzymes.[17] These neurotransmitters are involved in both mood and sleep and the importance of pyridoxine dependent enzymes in neurotransmitter synthesis has led researchers to consider whether vitamin B_6 deficiency may contribute to the onset of depressive symptoms.

DEFICIENCY RISK FACTORS

Severe deficiency of vitamin B_6 is uncommon. However, low plasma levels of active B_6 are found in chronic alcohol dependence, with obese states, pregnancy, preeclampsia and eclampsia, and malabsorptive states such as coeliac, inflammatory bowel disease, and bariatric surgery.[18]

Additional at-risk groups with inadequate intake or increased metabolic requirements may become functionally deficient in B_6. Included in this group are those with renal impairment, autoimmune disorders and those who drink alcohol on a regular basis.[18] Research also indicates that chronic stress may deplete vitamin B_6, while supplementation could be a therapeutic strategy in reducing stress levels.[19,20]

Certain pharmaceutical drugs, such as the tuberculosis medication isoniazid, penicillamine used in Wilson's Syndrome, levodopa for Parkinson's, as well as some anticonvulsant medications, may also interfere with B_6 metabolism.[18] Evidence also suggests that continuous low-dose oral contraceptives (OC) may negatively impact vitamin B_6 status. The depression in plasma PLP concentrations observed in OC users may reflect decreased body reserves of the vitamin, which could put women who discontinue OCs and become pregnant at risk of vitamin B_6 inadequacy during pregnancy.[21]

FOOD SOURCES

Mammalian cells are unable to synthesise vitamin B_6 *de novo*,[22] so we must obtain it from dietary sources. In addition, B vitamins are water soluble and do not remain in the body for long, so regular consumption is required.

Luckily, vitamin B_6 is found in a wide variety of foods. Some of the richest sources of vitamin B_6 include chickpeas, fish, beef liver and other organ meats, chicken and turkey, potatoes and bananas.[23]

The bioavailability of vitamin B_6 from animal products is quite high, estimated to reach 100 per cent for many foods.[24] In general, the bioavailability from plant foods is lower.[24] The presence of fibre reduces the bioavailability by five to 10 per cent, whereas the presence of pyridoxine glucoside (often present in plant sources) may reduce the bioavailability by up to 75-80 per cent.[24] Those following a strict vegan/vegetarian diet are therefore at greater risk of deficiency and may wish to consider supplementation.

PRODUCTION BY GUT MICROBIOTA

In addition to dietary intake, research also shows that in humans, members of the gut microbiota are able to synthesise most of the water-soluble B vitamins, including pyridoxine.[25]

In contrast to dietary vitamins, which are adsorbed in the proximal tract of the small intestine, the predominant uptake of microbially produced vitamins occurs in the colon.[26] Supporting a healthy microbial balance in the gut, for example, through the use of pre and probiotics and fermented foods, may therefore assist in optimising B_6 levels.

SUPPLEMENTATION SAFETY

As a water-soluble vitamin that is readily metabolised and excreted by the body, pyridoxine is generally assumed to have negligible toxicity, unless taken at high levels.[27]

The principal toxicity of concern associated with excessive intakes of vitamin B_6 from supplements is neuronal damage, and sensory and motor effects, which occur on a dose and duration dependant basis. Studies in humans and case reports indicate that severe neurological effects are only likely to be detected at very high doses of 500mg/day or more, and minor neurological symptoms may be apparent at 100mg/day or more if consumed for long periods.[28]

To prevent sensory neuropathy in virtually all individuals, EFSA's Scientific Committee on Food and Scientific Panel on Dietetic Products, Nutrition and Allergies (2006) has set a supplemental tolerable upper limit (UL) of 25mg/day for vitamin B_6,[28] whereas the UK Expert Group on Vitamins and Minerals (2003) set a supplemental UL of 10mg/day. However, this lower level is based on life-time exposure.[30]

Hannah Braye is a Nutritional Therapist, having studied at the College of Naturopathic Medicine (CNM), where she graduated with an award for outstanding performance. She is a member of the British Association of Applied Nutrition and Nutritional Therapy (BANT) and listed on the Complementary and Natural Health Care Council (CNHC)'s approved accredited register. She is Technical Advisor at ADM Protexin, manufacturers of the Bio-Kult and Lepicol ranges

G&G Vitamins – five decades of excellence

Family-owned and with a rich history dating back five decades, G&G Vitamins is in an exciting period of growth, honouring its roots whilst developing modern innovations. Rachel Symonds reports.

There are not many supplement brands in the industry that boasts the history, the skills and the experience that G&G Vitamins brings. Still family-owned, the company has spent the last 54 years supplying high quality supplements, both as a contract manufacturer and also with its ever-expanding own brand range.

But G&G is not simply trading off the back of its well-respected name and its history. The company is constantly evolving, paying close attention to developing quality supplements that have a unique position in the marketplace.

Alessandro Calcioli, the founder's grandson, who, several years ago took the reins of the G&G Vitamin brand and has been steering it back to its roots whilst also bringing in modern innovations, commented: "G&G Vitamins has been an ever-present force in the British supplement industry since its inception in 1965. Since that day, it has been a family-owned and operated company focused on creating high-quality supplements. Over the past two years, the brand has had a complete facelift, and every formulation has been gone through with a fine-tooth comb to ensure every product is as good as it can be."

Founders, David and Sheila Gaiman

FAMILY ROOTS

G&G Vitamins was founded in 1965 by David and Sheila Gaiman and was one of the first in the UK to manufacture multivitamins and minerals at a time when supplements were generally low dose and contained only solitary ingredients.

It has always been a family business, with the couple's daughter, Lizzy Calcioli, and her husband, Mauro, both being Directors and Alessandro also being heavily involved.

"G&G Vitamins is unique because it is a family company, with the history and range of a much larger pharma-owned supplement brand. When a practitioner buys G&G Vitamins, they know that care and attention has been put into making each and every pot because we have made the product in our own cleanroom, using our own specialist techniques, as well as a myriad of other industry standards," Alessandro explained.

"We take pride in our product and know that we are 54 years in the making and still going strong because we put our own reputation on the line with every product release, every advert, every tub and every capsule."

Because of this history, there are vast skills within the business. This includes two in-house CNM-trained practitioners, who work on product formulations, improvements, quality assurance and marketing information, while the Trade Sales Manager has been with the company for more than 20 years, and the Quality Manager first started with G&G in the late 1960s.

A core part of the business has always been with Nutritional Therapists, meaning the company makes great strides in terms of ensuring its products meet the high quality expected.

"Our products have been reviewed extensively by trained nutritional therapists, who have a set of guidelines to ensure that every formulation is, as much as possible, appropriate for client recommendation. Firstly, our labels are honest. We guarantee that we will always declare every single ingredient, no matter how small the quantity in the product. This includes the often-overlooked compounds, such as maltodextrin (which is unavoidable in certain oil-based raw materials)," Alessandro advised. "Because we declare everything, it allows the therapist and their client to make a truly informed choice, and they


Alessandro Calcioli

can avoid ingredients which are not suitable to their dietary requirements.

"Secondly, we make our products as pure as possible. Many of our products contain no fillers, no binders, and no excipients or flow agents. None contain magnesium stearate. Where we do have to fill up the capsule with another powder (necessary with micro-dose products such as vitamin A), we use alfalfa wherever possible, and steam-treated rice flour when the powder has a tendency to bind with moisture during encapsulation. Finally, we have made our range as extensive as possible, covering over 140 products (many of them specifically geared to nutritional therapists), so that clients and therapists can find all they need from us. In order to support nutritional therapists, we offer flexible incentive schemes, including trade discounts and both direct and in-direct referral rewards and discounts. We have detailed information on all our products, which is available online and in our Product Guide, designed specifically for our nutritional therapists."

THE DEVELOPMENT PROCESS

G&G goes through a number of processes when developing new products, the starting point being ascertaining if there is a gap and a need in the market.

"Either a gap in our own brand (where we know that if someone needs product X they'll also need product Y, but we don't sell Y), or a gap in the wider market, such as when we developed Kid's Rainbow Food, an organic whole food blend for kids with no sugars or sweeteners, just fruit and vegetable extracts with probiotics," he advised.

"Once we've found the gap, we'll speak to our buyer. As a manufacturer, we are in the unique position of being able to source ingredients directly through our own buyer, and we use this to find the best raw materials out there. We then work with our manufacturing team to figure out how to make the product as clean as possible, which means testing it on machines to ensure it can run smoothly without the need for excipients. During this time, our in-house practitioners review the ingredients and the ratios against scientific papers. What we're left with is a high-quality pure product based on real research and knowledge," Alessandro added.

And if G&G can't make it to match its quality standards, especially with regard to ingredients, it won't happen.

Alessandro commented: "We have a basic rule here; make it right or don't make it at all. This means that if we can't find ingredients that we consider good enough, and if our highly-

experienced encapsulation technicians can't run it without excipients, then we just won't make the product. This harks back to the fact we are family company, and so we won't release products just for a 'quick-buck' as it is our own reputation on the line. Thankfully, our buyer has over 20 years of experience with us and will search far and wide to obtain the very best raw materials that are out there. Meanwhile, our encapsulation technicians have over 90 years combined experience, and so, using our patented Trufil technique, can make the product work in the purest possible state."

BRAND DEVELOPMENT

A key focus for G&G Vitamins in recent years has been on building its own portfolio of products, including with a raft of NPD.

"The brand has developed new and innovative products, beginning with redefining the usual 'children's supplement' with the flagship product, Kid's Rainbow Food. These changes have seen UK sales more than double and opened up distribution channels in more than 10 new countries," Alessandro commented. "The family is committed to investing profits right back into the company, and as such, renovations have begun for a more modern, and greener workspace for the G&G Vitamin staff, as well as upgrades to the cleanroom facility, which will see it rise up to a whole new level of manufacturing excellence."

And the range is ever growing to tap into current market demands.

Alessandro added: "We stock a range of practitioner-led products, such as resveratrol, glutathione, betaine, P5P, 5-HTP and quinone. We've found that it is our unique blends have been the best received by the practitioner community. Products such as Advanced ProVeFlora, a 50bn strength, 14 strain probiotic blend that is suitable for vegans, or Bioactive B's, which include both active and inactive forms of the all-important B vitamins in order to help those with conversion issues. And then we have our core products, such as turmeric (with curcumin and black pepper, of course), high-strength K2 and even our high-strength vitamin C, which we find have a loyal following in the practitioner community thanks to their high-quality and competitive pricing."

CPD DIRECTORY

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

BANT Professional Supervision
June 27 – Surrey
July 10 – online
July 10 – Romsey

CPD hours: BANT two hours
Speakers: Ruth Taylor
Cost: £30
Website: bant.org.uk/members-area/bant-supervision/meet-the-supervisors/#Ruth_Taylor

BANT Professional Supervision
June 30 – Cheshire

CPD hours: BANT two hours
Speakers: Susan Fruhman
Cost: £30
Email: info@susanfruhman.com

BANT Professional Supervision
July 3 – Tunbridge Wells
July 15 – online
July 18 – Richmond

CPD hours: BANT two hours
Speakers: Carmel Buckley
Cost: £30
Website: bant.org.uk/members-area/bant-supervision/meet-the-supervisors/#Carmel_Buckley

BANT Local Network Meeting Terranova
July 3 – Bicester

CPD hours: BANT two hours
Speakers: Orley Moyal
Website: bant.org.uk/members-area/bant-local-networks/local-network-coordinators-list/#Rosie_Pearce

BANT Regional Branch Meeting Evidence-Based Approaches to Gut and Digestive Health
July 4 – University of Worcester

CPD hours: BANT five hours
Speakers: Benjamin I. Brown, ND. Clare Daley BSc Hons, PgDip, mBANT, rCNHC, AFMCP, Emma Beswick MBA, BA(Hons), NT (Dip CNM) and Justine Bold BA Hons, Dip BCNH, NTCC, PgCHE, FHEA. Student speakers: Eleanor Bushby – Mood Disorders: It's Not All in Your Mind, and Lucy Harper – Motivation for Gluten Avoidance in the Absence of Celiac Disease
Website: www.eventbrite.co.uk/e/evidence-based-approaches-to-gut-and-digestive-health-tickets-57773068804

BANT Regional Branch Meeting Nutrigenomics and Thyroid Health
July 11 – Leeds

CPD hours: BANT 3.5 hours
Speakers: Emma Beswick, Lifecode Gx
Website: bant.org.uk/members-area/bant-local-networks/local-network-coordinators-list-2/#Aileen_Smith

BANT Professional Supervision
July 12 – Woolpit

CPD hours: BANT two hours
Speakers: Fiona Mealing
Cost: £30
Website: bant.org.uk/members-area/bant-supervision/meet-the-supervisors/#Fiona_Mealing

BANT Professional Supervision
July 16 – Manchester

CPD hours: BANT two hours
Speakers: Dalbinder Bains
Cost: £30
Website: bant.org.uk/members-area/bant-supervision/meet-the-supervisors/#Dalbinder_Bains

BANT Professional Supervision
July 17 – Birmingham

CPD hours: BANT two hours
Speakers: Felicia Jones
Cost: £30
Website: bant.org.uk/members-area/bant-supervision/meet-the-supervisors/#Felicia_Jones

COOKING, *the keto way*

Will Cole makes it easy to cook keto-focused foods in his new book, *Ketotarian.*

Poached eggs over tomato-olive-caper sauce with fresh oregano

Spicy frittata pizza with spinach and olives

Coconut almond balls

Poached eggs over tomato-olive-caper sauce with fresh oregano

Serves 2
Vegetarian

Start to finish: **25 minutes**

INGREDIENTS:

- **3tbsp olive oil**
- **1tbsp minced garlic**
- **1¼ cups salt free tomato passata (puréed, strained tomatoes)**
- **8 pitted kalamata olives, halved**
- **1tbsp capers, rinsed and drained**
- **1tbsp minced fresh oregano leaves**
- **⅛ tsp freshly ground black pepper**
- **4 large eggs**
- **Sea salt**

METHOD:

1 Heat the oil in a deep, medium skillet over medium-high heat. When hot, add the garlic and sauté for two minutes (do not let it brown). Add the tomatoes, olives, capers, oregano, and pepper and bring to a boil over high heat. Boil until the sauce reduces to about one cup and has thickened, about five minutes.
2 Crack an egg into a ramekin and then add it to the sauce. Repeat rapidly with the remaining eggs and sprinkle the eggs evenly with salt.
3 Cover the pan and reduce the heat to medium-low. Simmer until the whites are opaque and the yolks are firm around the edges but still molten in the centre, three to five minutes. Serve immediately.


COCONUT ALMOND BALLS


SPICY FRITTATA PIZZA

Spicy frittata pizza with spinach and olives

Serves 2
Vegetarian
Prep: 15 minutes
Cook: 13 minutes

INGREDIENTS:

- 5 large eggs
- 2tbsp plain unsweetened almond milk
- ¼ tsp sea salt
- ⅛ tsp freshly ground black pepper
- 1tbsp olive oil
- 2tsp minced garlic
- ⅛ tsp chilli flakes
- 225g fresh baby spinach leaves, washed well and spun dry
- 115g soft fresh vegan cheese, sliced or crumbled
- 8 pitted kalamata or niçoise
- Olives, halved
- 6 fresh basil leaves, finely chopped

METHOD:

1 Preheat the oven to 190°C/375°F/gas mark 5.
2 In a medium bowl, whisk together the eggs, milk, one eighth teaspoon salt and one eighth teaspoon black pepper.
3 Heat the oil in a medium ovenproof non-stick frying pan over medium-high heat. When hot, add the garlic and chilli flakes. Cook for two minutes (do not let it brown). Add the spinach, the remaining one eighth teaspoon salt and the remaining one eighth teaspoon black pepper. Cook, stirring frequently, until the spinach is wilted, about two minutes.
4 Immediately, pour the eggs into the pan and reduce the heat to medium. Sprinkle the cheese and olives evenly over the top. Cook until the edges of the eggs are just set, about three minutes.
5 Carefully transfer the pan to the oven and bake until the eggs are cooked through, five to eight minutes. Sprinkle with basil and serve

POACHED EGGS

COCONUT ALMOND BALLS

Coconut almond balls

Serves 2
Vegan and vegetarian
Prep: 10 minutes
Chill: 40 minutes

INGREDIENTS:

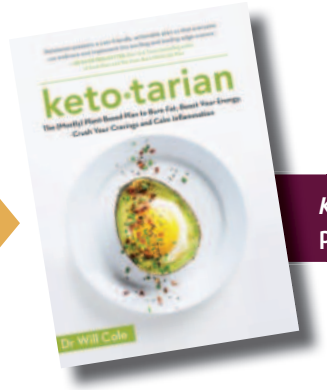
- **75g preservative free, sugar free creamy almond butter**
- **50g melted virgin coconut oil**
- **1tbsp cacao nibs**
- **¼ tsp vanilla**
- **4tbsp finely shredded unsweetened coconut**

METHOD:

1 In a medium bowl, combine the almond butter, oil, cacao nibs and vanilla; mix well. Cover and refrigerate for 30 to 40 minutes, or until firm enough to handle.
2 Place the coconut in a small dish. Using a one-tablespoon measure, scoop the mixture into eight portions and drop onto the coconut. Working quickly, roll into balls. Refrigerate for 10 minutes before eating. Store, covered, in the fridge.

SPICY FRITTATA PIZZA

POACHED EGGS



***Ketotarian* by Will Cole, published by Yellow Kite, £20.**

I-Mag giveaways

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

HIFAS DA TERRA DR REI AND DR LEO

Dr Rei is formulated for children containing the appropriate amount of reishi for overall reinforcement of the immune system for children, it is good for children with morning fatigue or nervous disorders. Also good for seasonal allergies and asthma and suitable for children from eight months to age 12. Containing lion's mane for safeguarding the digestive system, nervous system and immune system, Dr Leo is designed for children with attention deficit and cognitive disorders and is also good for children with food intolerances and intestinal disorders.

I:Win: We have six sets, comprising one Dr Rei and one Dr Leo to give away.

LINK NUTRITION BRAIN FOOD

Your desk-side essential, Link Nutrition's Brain Food contains a neuro-supportive blend of B vitamins, Bacopa monnieri, lion's mane mushroom, magnesium and turmeric. It is designed to help support normal cognitive function, reduce tiredness and fatigue, and maintain normal nervous system function. Stay focused and functioning at your peak.

I:Win: We have 10 bottles to give away.

PURE ENCAPSULATIONS CURCUMASORB

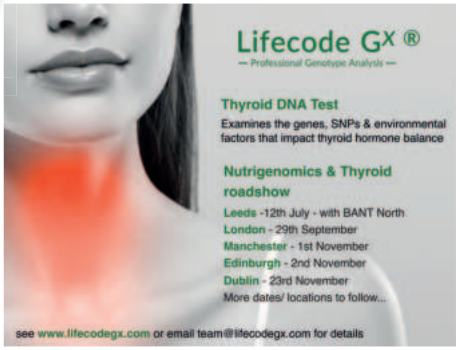
CurcumaSorb provides Meriva curcuminoid-phosphatidylcholine complex for enhanced-absorption and bioavailability. Entirely natural – with no pharmaceutical or synthetic ingredients – and mimics the enhanced absorption of turmeric seen with fatty food, such as golden milk, Meriva results in a unique profile of plasma curcuminoids that may closer resemble food than supplements[1]. Over 30 clinical studies support the efficacy of Meriva.[1.] J Nat Prod. 2011 Apr 25;74(4):664-9.

I:Win: We have five to give away.

ESKIMO-3 BRIGHT KIDS FISH OIL JELLY SPLATS

Eskimo-3 Bright Kids Jelly Splats is an exciting omega 3 fish oil designed specifically for kids. Each jelly tab, or 'splat' tastes great, is easy to take and provides 270mg of DHA, which supports healthy brain function. We know that it can be difficult to get our kids to eat enough fish, which is why Eskimo designed a fuss free alternative. Bright Kids contains the highest DHA level per tablet among competitors with similar products.

I:Win: We have 10 packs to give away.



THYROID DNA TEST AND LIFECODE GX TICKET

Lifecode Gx Thyroid DNA test examines the key genes and environmental factors – nutrient status, stress, and detoxification – that impact thyroid health, helping you to understand individual risk factors and root causes for thyroid imbalance and implement personalised nutrition and lifestyle changes to optimise your health.

Lifecode Gx Nutrigenomics and Thyroid roadshow ticket takes place in London, Manchester, Edinburgh, Dublin (other UK locations to be announced). Discover the key genes, SNPs, cofactors and inhibitors (including autoimmune factors) involved in the thyroid hormone lifecycle, and how to apply nutrigenomics in clinical practice.

I:Win: We have one Thyroid DNA Test, and one Lifecode Gx ticket to give away to one reader each.

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