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2019
Health Trends

from the Leaders in Gut Health, Bio-Kult

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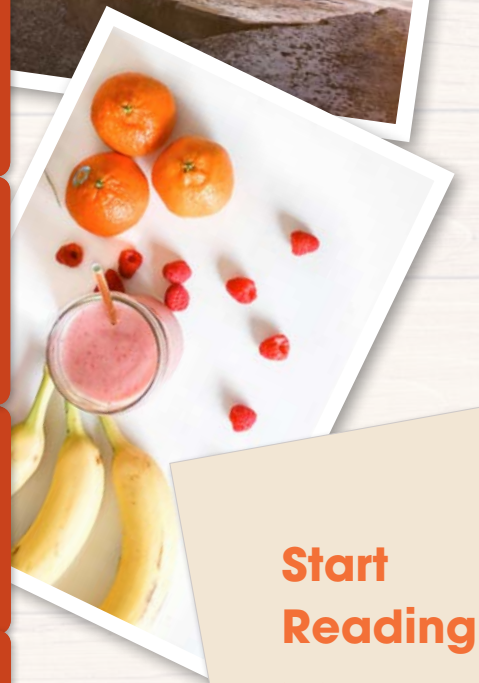

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Last year we shared our thoughts that more and more people understand the importance of having a healthy gut and that many people are looking to trends that support a healthy gut microbiome. To help support this we shared with you our Health Trends report for 2018. It proved to be so popular we thought you'd want to hear our thoughts for the quickly approaching 2019.

We still believe that an altered gut microbiome can affect many biologic processes, increasing the risk of disease, and there is a large body of evidence, showing positive effects for the use of live bacteria supplements in a range of health conditions. Since the industrial revolution, we have become increasingly less exposed to bacteria and other micro-organisms, which help to shape our gut microbiome.1 We live in an often overly sterilised environment, where we spend less time outdoors and our microbiome is exposed to higher levels of antibiotics, chronic stress and environmental pollutants. The consumption of fermented foods has also declined, as the invention of fridges and freezers; made this way of preserving foods unnecessary, further reducing our healthy bacteria range.

The Bio-Kult Health Trends Report for 2019 looks at what trends are hitting the headlines and how the use of a probiotics supplement can help improve gut health and boost the healthy bacteria in our bodies.

How Often Should We Eat?

Past advice of eating little and often or sticking to 3 regular meals is now being challenged with new research into intermittent fasting and time restricted feeding. So which is the healthiest for us and is there just one answer that fits for all of us?

For those with a blood sugar imbalances, such as those with diabetes or polycystic ovarian syndrome (PCOS), eating little and often may be good advice to follow for the short term. During this time it may be advisable to move from a diet high in refined carbohydrates and simple sugars to one rich in fibre, protein and natural fats. Carbohydrates are great to provide a quick release of energy into the blood stream to aid our fight or flight mechanism and can provide additional benefit when exercising. However, in our more sedentary lifestyles this sharp spike in blood sugar could lead to insulin resistance, inflammation, damage to cell membranes and build-up of fat storage (energy storage for future times of famine).

Eating at regular times each day is believed to work well with the body's natural circadian rhythms. If the body expects food to arrive at particular times it is seen to produce adequate digestive enzymes to assist in efficient food breakdown at these times. This could be of benefit to those who experience digestive issues such as bloating directly after meals or experiencing undigested food in the stools.

Intermittent fasting (IF) became a hot trend after a popular TV documentary and accompanying book where Michael Mosely proposed the 5:2 diet which touted the benefits of restricting energy intake severely for 2 days a week but eating normally during the rest of the week. The main benefits discussed were improving insulin sensitivity and prolonging life expectancy. There has been much talk of this within the media but less evidence-based support that can be used to generate recommendations for public health practice. A review paper by Patterson and Sears in 2017[1] discussed that together, striking evidence from animal studies and suggestive evidence from human studies strongly support the need for rigorous clinical investigation of using intermittent fasting regimens to improve health. The review largely focused on the health outcomes of changes in weight and in metabolic parameters associated with type 2 diabetes, cardiovascular disease, and cancer.

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Trending in 2019

The most current eating health trend I would say is `time restricted feeding' which is a form of IF. This involves having a longer overnight fast of 12-16 hours. This may mean bringing your evening meal forward to 6pm and your breakfast back to 10am. It is believed that it is during these night hours that healing and restoration can occur. Research is mounting for preventing and treating obesity and attenuating metabolic disorders including type II diabetes, hepatic steatosis and hypercholesterolemia, with benefits proportional to the fasting duration.[2] A 2018 12 week pilot study in obese subjects found that 8-hour time restricted feeding produced mild caloric restriction and weight loss, without calorie counting and may offer clinical benefits by reducing blood pressure.[3]

How probiotics could help

An additional benefit of this to the gut microbiota could be to encourage the movement of pathogenic bacteria through the digestive system, preventing a more recently discussed condition known as SIBO (small intestine bacterial overgrowth) where bacterial fermentation could be causing painful gas production after meals. The migrating motor complex (MMC) is a cyclic, recurring motility pattern that occurs in the stomach and small bowel during fasting; it is interrupted by feeding[4] but increased by the hunger hormone ghrelin[5]. One way to try and modulate the intestinal flora and support optimal digestive function is to consume a daily multi-strain probiotic, and especially to help offer a degree of protection to the gut lining if antibiotics are being consumed.

Whichever approach is followed I would suggest that circadian regulation is important to promote health benefits. I foresee much more research in these areas in the coming year.

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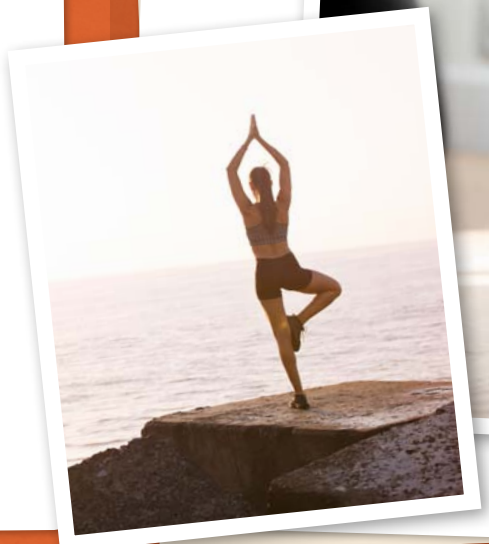
Do you go Little and Often or Hard and Fast?

When you're thinking about how often to eat the same thought process could also be applied to your exercise regime. Do you go Little and Often or Hard and Fast? Personal Trainer Beki Daniel delves deeper into what's best for our bodies?

Our bodies are designed to move but is attending an exercise class regularly, such as a Spin class or a HIIT session, enough when the majority of us lead heavily sedentary lifestyles? In the modernised world we don't have to leave the house to do our shopping, it's delivered straight to our door, we communicate via email in the office rather than visiting a colleague on the floor below. We spend more and more time sedentary whether that be sat at a computer or watching tv; on average the working adult spends 9.5 hours a day sedentary and this increases with age.[1]

Exercising regularly brings a whole heap of benefits both short term and long term to every aspect of your health. Improved cardiovascular fitness,[2] reduced blood pressure,[3] increased muscle strength and endurance,[4] increased bone density,5 increased lung capacity,[5] improved metabolism,[6] increased energy levels[7] (even with those suffering fatigue and chronic illnesses)[8] to list a few, and it doesn't stop at physical benefits! Exercising regularly can also improve brain function and has been shown to improve mood, reducing levels of anxiety and depression whilst releasing our feel good endorphins![9]

National guidelines suggest 150 minutes of moderate physical activity a week or 75 minutes of vigorous activity spread across the week along with 2 strength exercise sessions.[10] It's obvious that exercising regularly is better than not exercising at all but is it enough to reap the health benefits of physical activity if you spend the majority of your week sitting at a desk?



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There isn't enough evidence to suggest how much sitting is too much but research suggests spending large amounts of time being sedentary may increase the risk of some health outcomes, even among people who are physically active at the recommended levels.[11] Our muscles are not required to work as hard and essentially switch off whilst sitting for long periods of time, therefore we burn less energy than when we're standing or moving and our metabolism slows down. With that in mind, whether you've partaken in that early morning class or not if you're now sitting for the rest of the day many of your muscles are going to be disengaged for the majority of your day. Therefore taking regular breaks from extended sitting times combined with regular exercise can only be a good thing.

The NHS Move more, Sit Less campaign recommends breaking up long periods of sitting with short bouts of activity for just one to two minutes.[12] It's apparent that moving more combined with regular exercise can contribute to overall better health so what changes can we make to our daily routine to move more frequently?

1. Cycle or walk to work in the nicer weather. Or if you take the bus why not get off a stop or two earlier and briskly walk the last section of your journey. Try to elevate your heart rate for 10 minutes or more.
2. Set a regular reminder throughout your working day, perhaps every 30 minutes, to stand up from your seated position and move through a few dynamic stretches to engage your muscles and increase blood flow.
3. Take a walk with colleagues on your lunch break, aim for 30 minutes or more, talking and walking is a great way of increasing your heart rate!
4. Standing desks have become popular in the work place recently. You don't have to stand all day, alternating between standing and sitting regularly increases muscle activity.
5. Whilst watching TV perform small exercises during the ad breaks, eg. 10 squats on the first ad break, 10 sit ups on the second and 10 jumping jacks on the third.
6. Whilst talking on the phone or brushing your teeth pace the room or walk up and down your staircase.

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Medicinal Mushrooms – Ancient Wisdom to Modern Medicine

Introduction

Humans have known of the medicinal properties of mushrooms for centuries. Perhaps the earliest evidence of this is the mummified body (named Ötzi the Iceman) that was discovered in a glacier in Italy in the early 1990s. Ötzi, who lived 5300 years ago, carried two fragments of the medicinal mushroom Fomitopsis betulina, known to possess anti-parasitic properties.1 As Ötzi's colon was found to be harbouring the eggs of a parasitic worm, some scientists believe he may have used the fungus medicinally. Since then, fungi have continued to be traditionally used for medicinal purposes the world over. However, recent scientific advances have thrust them into the current medical and public spotlight.

Trending in 2019

Many associate medicinal mushrooms with Eastern culture, which has embraced the use of mushrooms in medicine. For example, products using *Coriolus versicolor* extracts are approved as adjunct therapy in China and Japan for cancer patients receiving chemotherapy or radiotherapy. However, many don't realise that a significant percentage of pharmaceutical drugs used in the West (such as penicillin, the immunosuppressant cyclosporine and statins) are derived from metabolites of fungi.[2] The last two decades has seen a significant increase in research into mushrooms for medicinal purpose, applying scientific rigor to traditionally held knowledge. With public interest in 'mycotherapy' (the use of mushrooms for therapeutic purposes) also rapidly growing, expect to see a real buzz around medicinal mushrooms in 2019.

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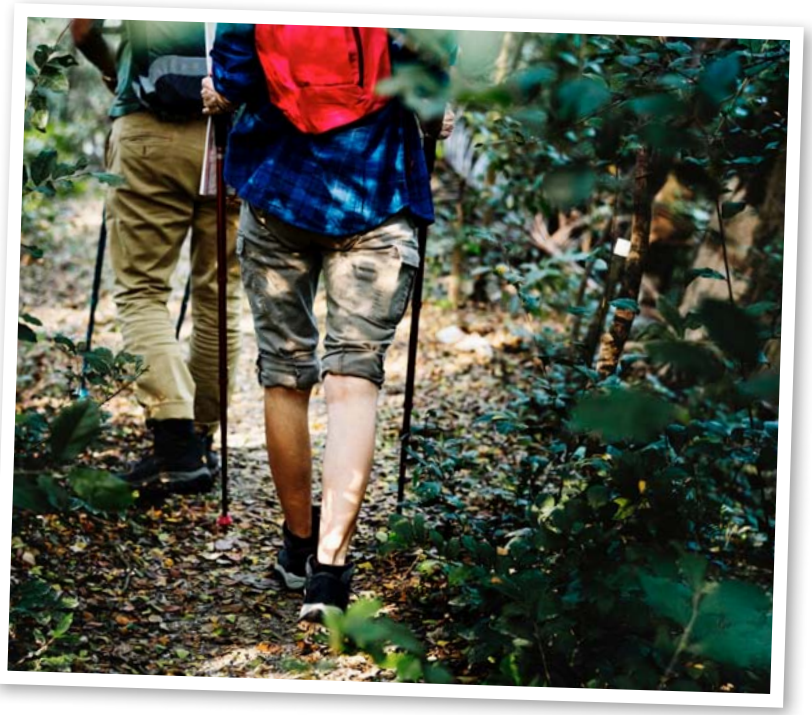
Mushrooms really are magic

Fungi are unique in that they belong to a kingdom of their own (being neither plant nor animal). However, research into the genomes of humans and mushrooms suggests that fungi and humans may actually share up to 50% of their protein sequences.[3] Mushrooms are also unusual in their ability to adapt and respond quickly to environmental stress and disturbance. For example, 250 million years ago the Permian-Triassic extinction event wiped out around 90% of marine species and 75% of land species, however there is fossilised evidence of excessive fungal activity at this time.[4] The ability of mushrooms to adapt and survive is likely due to the variety of chemical compounds they have developed over time, in order to defend themselves, and it is precisely this "chemical coat of protection" which provides them with their medicinal properties. In fact, a review in 2011 identified no less than 126 medicinal effects of mushrooms, including antitumor, immunomodulating, antioxidant, cardiovascular, antihypercholesterolemia, antiviral, antibacterial, antiparasitic, antifungal, detoxification, hepatoprotective, and antidiabetic effects (to name a just a few).[5]

Mushroom and probiotic synergy

One of the most significant properties of medicinal mushrooms is that (similar to probiotics) they are able to modulate both the innate and acquired immune systems. Medicinal mushrooms primarily do this via compounds called β-glucans. These compounds, which are able to interact directly with receptors on immune cells, help the immune system remain vigilant against pathogens and cancerous cells and maintain immune tolerance.[6] For this reason medicinal mushrooms show exciting promise for the management of immune related disorders such as cancer, autoimmunity, allergies and atopic and other inflammatory conditions.



Mushrooms are also rich in prebiotic polysaccharides, which act to stimulate the growth of beneficial gut microbiota.[7] Similar to probiotics, certain species of mushrooms, such as *Hericium erinaceus* (Lion's Mane mushroom), have also been shown to protect against gastric mucosal injury, helping to regenerate and repair the gut lining[8] (where over 70% of immune cells reside).[9] With a growing body of research evidencing the crucial role our gut microbiota play in supporting many aspects of health, medicinal mushrooms could be a useful addition to probiotics for modulating microbial composition and diversity in a wide range of conditions.

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How to gain the benefits

So, how can we harness the powers of medicinal mushrooms to support good health? Increasing consumption of edible species in the diet is a great strategy for preventative health. Mushrooms are a naturally nutritious food, having a high protein content (up to 45 %) and jam packed full of vitamins, fibers, minerals and trace elements, whilst also being low in calories.[7] Shiitake, oyster and button mushrooms (all of which have medicinal properties) are now available in many supermarkets and veg shops, or can be purchased from specialist suppliers online in either fresh or dried form. The climate of the UK also means you will often find an abundance of wild mushroom species, especially at certain times of year, creating a forager's paradise. If foraging wild mushrooms, always go with someone trained in mushroom identification and preparation and consult a variety of comprehensive identification resources before consuming. For those suffering with more acute medical conditions, mushroom supplements may be beneficial to obtain a more therapeutic dose. These come in both powder and extract form (extract being the stronger), and should ideally be made using the fruiting body of the mushroom, rather than the delicate mycelium, which can be easily damaged during processing.

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Prevention, Prevention, Prevention

Introduction

With the onset of winter comes a heightened risk of colds and flu. In both cases, the illness is caused by viral infection, with colds caused by any one of a range of rhinovirus infections, and flu caused by influenza (type A, B or C). There is of course a vaccine to help prevent flu (specifically against influenza type A and/or B), however the effectiveness of this vaccine is variable year-on-year. For the 2016-17 flu season, Public Health England estimate that in 18-64 year olds, the flu vaccine was 40.6% effective.[1] Concerningly, they reported no significant effectiveness in those aged over 65, a patient group in which influenza infection is felt most acutely.

Trending in 2019

Colds and flu are common seasonal illnesses, with flu in particular being associated with significant levels of morbidity and mortality. Indeed, the Oxford vaccine group reports that in an average year, 600 people will die of complications from flu in the UK. Frighteningly, this can rise to over 10,000 deaths in particularly difficult years.[2]

Our bodies have a number of defences to prevent viral infection and, if infection has occurred, to eliminate the virus. Whilst some defences include physical barriers (e.g. skin, cilia and mucus), the main defence to eliminate a virus infection is through the immune system.[3] This can occur by the release of cytokines (substances that help to activate immune system cells) or by T-cells, which destroy infected cells, thereby reducing the viral burden.[3] However, as we age, our immune system weakens - this is why older individuals (or those with a compromised immune system) are particularly vulnerable to colds and flu.[4]

How probiotics may help

So what are our options for preventing cold and flu, and is there any way to boost the effectiveness of the flu jab? Intriguingly, a useful way to stop these viruses from taking hold may be to use other microbes – beneficial bacteria in the form of probiotics present in the gut. Colds and flu are driven by viruses that move through the air and infect the respiratory tract. Therefore those viruses may not come into direct contact with probiotic bacteria. However, by modulating the immune response, probiotics may indirectly help tackle respiratory viruses via a holistic approach.[5] The immune system is highly complex, and requires stimulation by probiotic bacteria in order to efficiently neutralise pathogens. Specifically, probiotics are known to increase levels of the cytokine interferon- which is secreted by the immune system.[6]

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Interferon is a critical component for defence against viral infection, and so boosting these levels may confer additional protection against respiratory viral infection.

But while the theory behind the benefits of probiotics to prevent cold and flu might be compelling, is there any evidence demonstrating clinical benefit? In fact, a double-blind, placebo-controlled study of 136 adults published in early 2018 found that administration of a multi-strain probiotic significantly reduced the rate of upper respiratory tract infection and flu-like symptoms, illustrating that probiotics do help prevent colds and flu.[7]

In vulnerable patients, the flu jab is recommended due to the risk of morbidity and mortality, but it is not particularly effective in elderly patients as mentioned earlier. However, probiotics may also be a useful avenue in this regard. A recent systematic review by Zimmermann and Curtis assessing the effect of probiotics on vaccine responses identified a number of studies which showed an improved response to the flu vaccination when probiotics were given as an adjunctive therapy, suggesting that they may help improve effectiveness.[8]

The modulation of the immune response by probiotics provides a holistic mechanism to challenge extraintestinal infections, including respiratory infections such as colds and flu. Additionally, by boosting flu jab effectiveness, probiotics may be a vital component to reducing the risk of flu in particularly vulnerable patient group.

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Personalised Care Fit for 21st Century

Can you imagine a clinic where you walk in, scanners run tests that in a second determine the problem for which a single dose treatment is manufactured on site within seconds, to fix the problem in minutes? Sounds like a scene from Star Trek, but actually it is the ultimate aim of personalised and precise care. We are not there yet, but we are certainly at the beginning of the journey to Star Trek style care.

Medical care is taking a new shape with the vision to modulate health and diseases via the microbiome and nutrition based interventions matched with medical treatments, psychological support and in response to genetic profile. Nutrition is the aspect that by many doctors is wrongly perceived as less scientific than medicine, but in the last century nutritional sciences have made a huge step forward. From adequate nutrition (ability to access food), to improved nutrition at population levels (food fortification), to stratified nutrition (disease specific foods and diets) we are now looking towards personalised and precise nutrition (specific product/ advice for an individual).

A + B + C = Personalised Care

To achieve successful personalised care we would require answers to three main questions: Who?, What?, and When?, but on a much deeper level than we think today. Who? refers to the patient's condition and his/her phenotype (physical appearance resulting from the genetic information and the influence of the environmental factors like diet, lifestyle, physical activity and microbiome). What? determines the most suitable treatment for the individual and that includes medical, psychological, nutritional and lifestyle advice or intervention administered at the right time in the right order.

Are we there yet?

Not exactly, we have opened the door to this new world, but more needs to be learned. Advanced stratified care is the first step on the way to personalised care. How does it work in practice? Stratification is an attempt to answer the 'Who?' question. In its simplest form it is grouping similar people together assuming that their similarity in the outlook (i.e. disease symptoms) is related to similar reason of the problem (pathology), hence they would benefit from similar treatment. For example, many women suffer from discomfort or infections of urogenital tract. This group could be stratified into women with bacterial infections, like urinary tract infections (UTI), or yeast infections, like thrush. Antibiotics will only help those with bacterial infections, while antifungal treatment would be prescribed for thrush.

This represents a model of stratified medicine, which then should be complemented with stratified nutritional care and potential lifestyle changes. Since both infections are microbial and present with inflammation, nutritional intervention could include supplementation with probiotics. Evidence suggests that certain probiotics can inhibit growth of pathogens causing UTIs [1], but also have systemic effect, improving immune response and reducing inflammation [2]. Products developed specifically to support standard UTI treatment and recovery like Bio-Kult Pro-Cyan would have a different composition to products recommended for yeast infections such as Bio-Kult Candéa.

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Responders vs non-responders

Even though the market is full of products that are tailored for specific conditions, unfortunately they do not guarantee that all patients will benefit. Ambitions of medical and nutritional scientists are to develop tests that predict if an individual is going to respond to a specific treatment or not (stratification into responders and non-responders). By doing so, the care plan would be selected based on the highest chance of a response. This responders vs non-responders and probiotic treatment approach has been studied for almost a decade and irritable bowel syndrome (IBS) is a good example of this.

We know IBS patients have a different composition of gut bacteria to healthy people. Furthermore, nutritional interventions introduced in those patients (e.g. diets like low FODMAP [3]) have been linked with further change in the microbiome, which was effective for some, but not all IBS patients. Studies have shown that by knowing the microbiome at baseline, you could predict who will respond to different dietary modifications[4].

So if you are a non-responder, can you change it? In 2015 scientists suggested that children with IBS respond better to dietary modifications if their baseline microbiome was enriched in bacteria utilising carbohydrates (saccharolytic bacteria like *Bifidobacteria and Bacillus*).

So possibly, if you increase the abundance of those bacteria with probiotic supplements such as Bio-Kult Advanced before the dietary modifications, you increase the likelihood of positive response. Even more, in some IBS patients probiotic supplementation could be sufficient (without the need for dietary changes), a recent study in IBS patients with diarrhoea showed that a multi-strain probiotic improved symptoms, especially the reduction of pain, bloating and diarrhoea, as well as quality of life[5], without any other dietary modifications. This shows that timing and the order of intervention is crucial for a successful care plan.

The more we know about nutrition, microbiome and health, the closer we are to providing personalised care. By understanding genetic and environmental influences, especially microbiome profiles, we could offer treatments that are tailored to the needs of an individual based on his/hers specific phenotype. Whilst we're not ready to provide precise care in its full meaning yet, the benefits of a well-chosen and delivered holistic stratified care, including aligning nutritional, medical, lifestyle and genetic components, could offer successful care, fit for 21st century.

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Children are our Future

Introduction

A recent report has stated that nearly one third of children aged two to fifteen in the UK are overweight or obese.[1] Worryingly, children with severe obesity are at greater risk for adult obesity, early atherosclerosis, hypertension, type 2 diabetes, metabolic syndrome, fatty liver disease and premature death.[2]

Not surprisingly then, the UK government are focusing on trying to reduce the levels of childhood obesity in the UK through initiatives such as a potential ban on end of aisle sweets, restrictions on 'junk food' advertising and a sugar tax. Obesity is a complex issue though with many different factors influencing its development, we now understand that it is not as simple as consuming more energy through foods than we use in activity.

Trending in 2019

As family life gets busier, parents often have to adopt methods to save their time. This can lead to some families making poor food choices, opting for takeaway meals, eating late into the evening and purchasing more pre-prepared and processed foods.

Our diet influences the shape of our gut microbiome with different species flourishing on specific nutrients from the foods we eat. Studies have suggested that an obese microbiome has an increased capacity to harvest energy from the diet.[4]

Suggesting that if a lean and an obese child ate the same meal, the obese child would actually absorb more calories from their meal. As well as the food we eat affecting our microbiome, the reverse could also be occurring. Research has revealed that microbes generate cravings for foods that they specialise on or foods that suppress their competitors.[5]

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How can probiotics help?

Evidence suggests that gut microbiota is involved in the control of body weight, energy homeostasis and inflammation which all play a role in the pathophysiology of obesity.[6] It has been proposed that improving the gut microbiome of overweight and obese children could reduce the likelihood of the condition continuing into adulthood.[6]

Research suggests that probiotics may have different mechanisms of action in their effectiveness on obesity, from reducing fat storage, altering gastrointestinal hormones and reducing intestinal permeability.[6]

One such probiotic study showed a lowering effect on abdominal fat and overall body weight. This particular probiotic was studied in 87 adults with obese tendencies over a 12 week period and resulted in significant decreases in both visceral and subcutaneous fat levels as well as body weight.[7]

As there are so many possible factors involved in the development of obesity, it is unlikely that there will be one solution. However, a multi-strain probiotic alongside improvements to the child's lifestyle could certainly be a step towards developing and maintaining a healthy body weight.

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Psychobiotics

A spotlight on mental health

Talking about mental health used to be a difficult subject. Topics that were once taboo are now talked about openly and mental health is squarely in the mainstream. Physical and mental health are increasingly thought of as inherently interlinked, here we take a look at the exciting and rapidly evolving evidence around the gut-brain-axis and specifically 'psychobiotics'.

What are 'PSYCHOBIOTICS'?

'Psychobiotic' is the name given to probiotic bacteria which are thought to have an effect on brain function. Certain probiotic strains have evidence of clinical benefit in conditions like anxiety, depression, autism and dementia.

How are psychobiotics thought to work?

1. Via changes in levels of neuro-active molecules like serotonin and BDNF (brain derived neurotrophic factor).

• Serotonin is one of the major neurotransmitters involved in the pathophysiology of depression and anxiety. In animal models, low levels of serotonin can be normalised with probiotic bacteria[1].

• BDNF supports the survival of existing neurones as well as promoting new growth. In animal models, disrupting the natural gut microbiota leads to decreased levels of BDNF[2].

2. Systemic effects on the stress hormone axis (the hypothalamic-pituitary-adrenal (HPA) axis):

• Animal models show that an altered gut microbiota can lead to an exaggerated stress response and elevated stress hormones [2].

3. Impact on emotional and cognitive processes:

• In a human study using brain imaging technology (functional MRI), 4 weeks of a multi-strain probiotic altered emotional processing compared to placebo[3].

• Some probiotic species appear to affect the levels of certain neurotransmitters:

- Dopamine and noradrenaline by members of the *Bacillus* family
- GABA by the *Bifidobacteria* family
- Serotonin by the *Streptococcus* family
- GABA and acetylcholine by the *Lactobacilli* family

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Modulating these chemical transmitters is the mainstay of conventional treatments for common psychiatric conditions like depression, anxiety and memory problems. Therefore there is a lot of interest in the idea that probiotics could be used to favourably alter levels of these neurotransmitters.

In a number of animal experiments, probiotic and antidepressant effects have been comparable [4].

• Prolonged periods of anxiety can have a marked impact on certain biomarkers. For example chronic stress is associated with elevated pro-inflammatory cytokines like IL-6 and TNF-α.

• Elevated levels of IL-6 were directly related to decreases in microbiota abundances of a number of species. The consequence of this may be that when suppressed, they allow for an expansion in other species, such as inflammatory species like clostridia [5].

• One potential mechanism here is that stressor exposure causes changes to the microbiota structure, which leads to bacterial translocation (bacteria pass through the intestinal wall into the body) which triggers an immune reaction [6].

What does the research show?

• The gut-microbiome-brain -axis and the use of probiotics to influence this system has received lots of attention in academic circles in recent years and a wealth of research has delivered promising initial results.

Animal research evidence:

• Mice fed *Lactobacillus rhamnosus* expressed fewer depressive and anxious behaviours and these changes were accompanied by a blunted corticosterone (stress hormone), suggesting that the probiotic down-regulated HPA-axis activity [7].

• Healthy adult rats were administered *Lactobacillus helveticus,* citalopram (an antidepressant), or no intervention, while exposed to stressful stimuli. Compared to the control group, the probiotic- group showed lower levels of anxiety and corticosterone. The probiotic group also showed increases in the anti-inflammatory cytokine interleukin-10, BDNF and serotonin [8].

• In a 2017 study, rats with histopathological features of Alzheimer's disease given the probiotic *Lactobacillus plantarum* showed improved cognition and improvement in levels of the neurotransmitter acetylcholine [9].

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TREND 6

Human research:

• In a randomised double-blind study, healthy male and female volunteers consumed either a mixture of probiotics or a placebo for 30 days, after which participants completed a range of self-report measures on mood and distress and urinary cortisol levels were measured. Relative to placebo, probiotic-treated participants showed significant decreases in negative mood and distress. Parallel to this was a decrease in urinary free cortisol, which is suggestive of reduced stress[10].

• In a 2015 study, healthy male and female participants consumed either a placebo product or a mixture of several probiotics over a period of 4 weeks. Relative to placebo, probiotic-treated participants exhibited substantially reduced reactivity to sad mood (assessed by the Leiden Index of Depression Sensitivity Scale) [11].

• In a 2013 study, autistic children were given a multistrain probiotic for six months after which caregivers reported a significant decrease in the severity of autistic symptoms [12].

What does the future hold for psychobiotics?

• The hope is that as we learn more and more about the microbiome we will be able to tailor psychobiotic treatments to a range of psychological and mental health issues providing hope for millions of people suffering with mental health and neurodegenerative diseases.

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Watch this space

Probiotic skin-care

The healthy-ageing trend is set to continue in 2019. Our skin is the most visible reflection of our health and age, but whilst many anti-ageing products focus on (usually very expensive) lotions and potions to apply topically, research is indicating that what we put inside our bodies in terms of food, and the health of gut microbiome is of importance in the battle against wrinkles. Live bacteria supplements taken orally are showing great promise for delaying skin-ageing due to their ability to help increase skin hydration, protect against UV damage and produce nutrients needed for collagen formation.[1] For example, one study found that after just 12 weeks of supplementation there was a significant reduction in wrinkle depth, improved skin gloss, and skin elasticity increased by an impressive 13.17%.[2] Like the gut, the skin hosts its own community of micro-organisms and research is indicating that topical probiotics may be a natural, targeted treatment approach to several skin disorders and a complement/alternative to conventional therapies which often present a number of undesirable side effects.[3] This is reflected in the increasing number of cosmetic companies now adding probiotics to their topical skin-care products.

Plant based diets

The trend towards plant-based diets is also set to continue (with this being one of the fastest growing hash-tags on instagram, in comparison to the declining use of 'clean-eating'). Plant-based diets can encompass a variety of ways of eating, not just vegetarianism and veganism, with high quality ethically sourced meats also making an appearance of plant-based menus, allowing for the inclusion of increasingly popular flexitarian eating habits. Plant-based diets have recently been given scientific support following the publication of the first results from the UK and American Gut Project. This crowd sourced, global citizen science effort allows members of their public to submit their stool samples for analysis (with over 15,000 samples from more than 11,000 individuals being submitted so far). There are a number of interesting results originating from the project so far, but one of the most clear is that those who eat the widest variety of plants each week (more than 30), show significantly increased diversity in their gut bacteria and fewer antibiotic resistant genes.[4] This is regardless of other dietary factors, such as whether they eat meat. Challenges to eat 30 or even 50 different plant-based foods a week, in order to encourage diversity in the diet and gut are therefore growing in popularity.

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Watch this space

Zero-waste

There is growing consumer momentum demanding for the reduction of waste and plastic in all aspects of life. Zero-waste shops are proving particularly popular, opening on many high-streets and no longer being seen merely as a bulk-buying opportunity for those that love lentils. As packaging is thought to account for around 1/5 of food costs,[5] these shops, where customers take their own containers to fill up on household staples, make economic as well as environmental sense.

They also tend to be independently owned and often stock local suppliers, meaning customers are putting more money back into the local economy, in addition to becoming community centres for like-minded people.

Edible Insects

The search for more sustainable protein sources continues (in last year's Health Trends Report we wrote about increasing consumer use of plant based proteins). A new addition to this trend is the culinary use of edible insects, with sustainable festivals such as Shambala introducing them to the otherwise vegetarian menu and their appearance on fashionable restaurant menus. As well as providing a more environmentally friendly source of protein, interestingly a recent study showed that consuming whole cricket powder had a beneficial effect on gut microbiota composition, increasing bifidobacteria levels and reducing inflammatory markers.[6]

and Digital Detoxes

One major difference between our current lifestyle and those of our evolutionary past is an increasing distance from natural settings with increased urbanisation and dependence on technology. There has been a considerable increase in the use of smartphones in recent years, with the average Brit thought to check their phone more than once an hour and over 10,000 times a year.[7] This compulsive checking and scrolling on smart phones is increasingly being associated with negative health consequences,[8] which is leading some health professionals to advocate 'digital detoxes' where people completely disengage with technology for a set period of time (eg. over the weekend). Coupled with this is the increasing popularity of 'Nature Therapy' where participants re-engage with nature in order to promote mental and physical well-being. In recent years, scientific evidence supporting the physiological effects of relaxation caused by natural stimuli has accumulated,[9] with many predicting that nature therapy will play an increasingly important role in preventive medicine in the future (with many important role in preventive medicine already springing up). Getting out in nature therapy retreats already springing up). Getting out in nature also has the added bonus of exposing you to a wide range of micro-organisms, likely to help support gut flora balance and the immune system.

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Watch this space

Nutritional psychiatry

The growing interest in psychobiotics is part of a wider trend of 'nutritional psychiatry'. A lack of essential nutrients is believed to contribute to the onset of poor mental health in people suffering from conditions such as anxiety and depression, bipolar disorder, schizophrenia and ADHD.[10] Nutritional psychiatry is a growing discipline, which focuses on the use of food and supplements to provide essential nutrients as part of an integrated or alternative treatment for mental health disorders. In addition to probiotics, recent research shows promising results for high-quality diets, omega 3 fish oils and prebiotics,[11] along with a number of other nutraceuticals,[12-13-14] for reducing the risk of developing symptoms of depression, anxiety, and stress. Medical education has traditionally excluded nutritional training and its association with physical and mental disease. However, based on emerging scientific evidence, there are increasing calls for nutritional psychiatry to play a bigger role within conventional health services, if the burden of mental ill health is to be reduced.

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About Bio-Kult

Microflora and the Benefits of Probiotics

The trillions of microflora in the human gastrointestinal tract play an essential role in supporting and maintaining strong immune and digestive systems, so having the optimum balance of these beneficial bacteria is important throughout life. At birth the infant's gut flora is influenced by that of the mother and the environment around them. Throughout life a number of factors can compromise this balance, including antibiotic therapy, infection, stress, travel or a period of unhealthy nutrition or lifestyle. The aging process is often associated with a change in gastrointestinal tract function, immunity and a disturbed microflora balance. An effective solution for all the family is to supplement the microflora by taking a probiotic to help restore the balance.

Conditions to Consider

An imbalance of the gut microflora can be associated with a range of conditions:

- Irritable Bowel Syndrome (IBS)[1]
- Traveller's stomach[2]
- Antibiotic Associated Diarrhoea (AAD)[3]
- Inflammatory bowel[4]
- Leaky gut[5]
- Lactose intolerance[6]
- Atopic dermatitis[7]
- Autism[8]
- Anxiety and depression[9]
- Autoimmune conditions[10]

The use of probiotics is supported by their potential to:[11]

- Modify the composition of gut microbiota;
- Enhance resistance to potential pathogens, via competitive adherence to the mucosa and epithelium; competition for nutrients and the production of anti-microbial substances;
- Strengthen gut epithelial barrier function; and Modulate the immune system to convey an advantage to the host.

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The entire Bio-Kult range:

- Can be stored at room temperature without the need for refrigeration
- Total bacteria count viable until end of shelf life
- Suitable for children and pregnant women*
- Gluten free
- Contains soya and milk, used in the fermentation process. Content of milk is at a level that would not affect lactose intolerance sufferers
- Made in the UK

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