AUG 2019

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FOOD, NUTRITION & SAFETY MAGAZINE

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EDITORIAL

Many decades ago teachers in schools and colleges were worshipped and they used to put in a lot of efforts to ensure that the students learn things and develop into useful persons when they go out into the commercial world. Things have changed since then. Although teachers are still trying very hard to catch the attention of students very sincerely, putting a lot of efforts, students are not as attentive or even interested in lectures. What has changed?

One of the biggest changes is the Information Technology (IT). Students have such easy access to information like never before. This information need not be just information useful in getting good grades or for improving their career development, but also from the entertainment fields. Although learning about science, math, arts and social subjects has been made extremely interesting to learn because of this new technology, but it is no competition when it comes to TV shows and movies from the entertainment world.

Even a couple of decades ago, students would find it extremely difficult to resist such attractions from TV and movie theatres. They would miss classes to enjoy these outside attractions. But recent IT advances have tipped the scales even more so with mobiles that students don't even have to go out of classrooms to enjoy these entertainments.

Students can now watch movies, reality shows or sitcoms, sports, music, or catch up on their social media connections without even going out of classrooms. Can any teacher match this kind of magnetism so he or she can teach a serious subject to the students?

Now students also find that class assignments could easily be done with information or solution on the Net. One can easily Google anything and after getting the right thing you can cut & paste the same into a really great essay. Of course teachers are also getting smarter nowadays and they can sniff out such borrowed pieces of work submitted as assignment.

One can now find all kinds of presentations with very attractive images to learn any subject using net. One can now Google any solution for any problem, even diseases. Doctors are complaining that patients have started telling them what disease they have and what medication the doctors should be prescribing.

There are rural places where having schools is difficult so now it is possible to have teachers who will teach on-line or through Skype. Will it also happen in cities where schools are overcrowded so students need not come to classes but learn from where they stay and appear for exams on-line and probably receive certificates in soft form and can print them if necessary?

Can the teachers make use of the same technology to make students come to classes with some interest? Earlier making attractive slides and presentations to help one's lecture was useful but now students can easily find even more attractive presentation on-line. Even the laboratory experience could be available with interactive on-line learning sites. This is going to be a tough competition which not only educators need to consider but also governments. Funding for education has been constantly pruned for other commercial growth-promoting activities so education becomes neglected. With lack of infrastructure and poor remuneration it will be extremely difficult for dedicated teachers to be attracted to schools and colleges.

The current decision makers should realise that a large part of reason they have succeeded was because they had excellent teachers showing them path in their formative years. The same opportunity should be available to the current students so they can one day become excellent decision makers.

Prof Jagadish Pai,
Executive Director,
PFNDAI

MANAGING STRESS THROUGH DIET - A POSSIBILITY?

By
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In the times we are living, stress and its consequences are an inevitable reality. We experience stress whether it is work deadlines, dealing with difficult colleagues, navigating the ever-growing and reckless traffic, relationship hassles, heart-break, among others. In a nut shell, STRESS IS OMNIPRESENT!

Understanding Stress

The term stress was first employed in a biological context by the endocrinologist Hans Selye in the 1930s. Selye and Wolff (1982) defined "Stress in biology indicates a state within a living creature, which results from the interaction of the organism with noxious stimuli or circumstances".

As per Morgan et al. (2008), "Stress is an internal state which can be caused by physical demands on the body (disease conditions, exercise, extremes of temperature, etc.) or by environmental and social situations which are evaluated as potentially harmful, uncontrollable, or exceeding our resources for coping". The physical, environmental and social causes of the stress state are called "stressors".

Stress in essence is our body's natural response to dangers by the "Fight or Flight" mechanism. In the caveman, the threats were essentially external such as being attacked by predators, being chased by carnivores, etc. These would evoke the "Fight or Flight" response in the person. The body readies itself by increasing the levels of the hormone cortisol in the blood, secreting adrenaline, inducing rapid heartbeat, increasing the rate of breathing and raising the blood glucose levels to help run away from imminent danger or to fight the predator.

The thing about facing a stressful situation is that it is supposed to be temporary in nature. Once the stressor or threat is gone, the body and mind is supposed to return to normal. And so it does, as the dangerous situation passed and things became normal again.

In present times we are safe from predators and there is no immediate danger to our life in the civilized society. However, we are facing stress and anxiety on a regular basis in the form of work deadlines, quarterly targets, chaotic and never ending traffic, pressure to succeed, financial aspirations, etc. Even planning a holiday to get away from it all is stressful!

In fact these days stress makes an early start with young children being coached for nursery admissions, competing for academic excellence, admissions in higher institutions, scoring a perfect 100 in exams, the list just goes on. What ails our society these days is prolonged and perpetual stress.


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Prolonged stress tends to go unnoticed and unacknowledged in present times. We are all getting accustomed to living with perpetual stress, which is potentially dangerous. Such prolonged stress takes a heavy toll on a person's physical and mental health. By the time we realize it, we are already dealing with sleep deprivation, body aches, hyper acidity, ulcers, elevated blood pressures, mood swings and burn out, etc.

Positive & Negative Stress

Selye (1975) proposed that stress can be both positive and negative.
- Eustress or positive Stress and
- Distress or negative Stress.

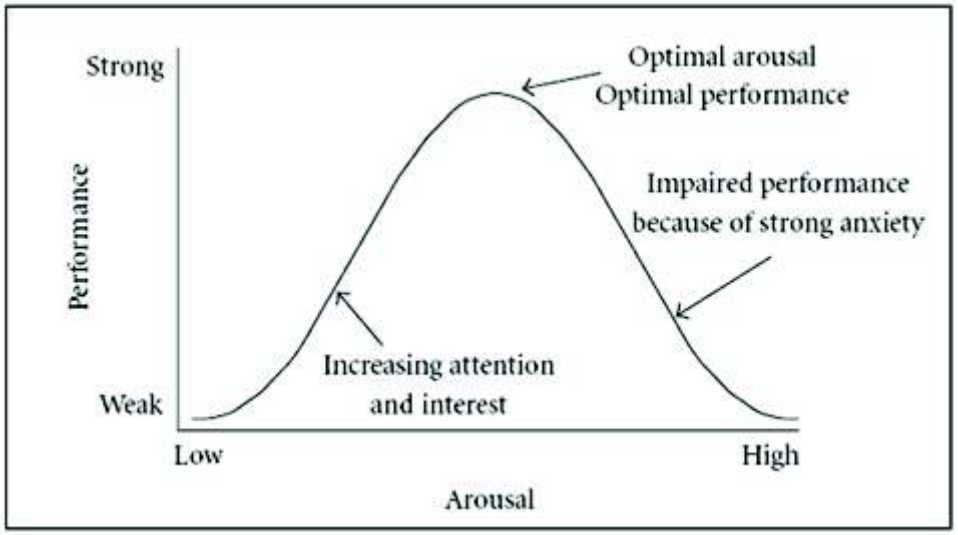
He published a model dividing stress into eustress and distress. Where stress enhances function it may be considered eustress.

The Yerkes–Dodson law (1908) is an empirical relationship between stress (referred to as arousal) and performance, originally developed by psychologists Yerkes and Dodson in 1908. The law dictates that performance increases with physiological or mental stress, but only up to a point. When levels of stress become too high, performance decreases. (Figure - 1).

To explain it in simple words, the extent of stress we feel when we are preparing for an exam or an interview will depend on our state of preparation and time available. If we are able to achieve an optimal stress level without excessive anxiety, our performance peaks. However if we feel overly strained or anxious, our performance will decline. One needs to recognize the signs and symptoms of stress turning from positive to negative and take remedial action.

How does Negative stress affect us?

Figure - 1: The Yerkes Dodson Law



The cumulative impact of stress can manifest itself in obvious illnesses such as ulcers, depression, diabetes, trouble with the digestive system or even cardiovascular problems, fatigue, lowered immunity, impotence, dermatological problems, along with certain mental illnesses.

Morgan et al. (2008) revealed that once induced by stressors, the internal stress state can lead to various responses. It can result in a number of physiological, behavioural, emotional and cognitive responses.
- Physiological
- Emotional
- Cognitive
- Behavioural

Physiological responses include heightened muscle tension, pain and tightness in the chest; indigestion and gaseous abdominal distension; spasmodic, gripping abdominal pain and diarrhoea; frequent urination; alteration of the menstrual pattern; tingling feelings in the arms and legs, elevated blood pressure and rapid heartbeat, pain in the neck or lower part of the back; persistent headache, migraine; skin rash and impotence.

Emotional responses include heightened anxiety, depression, excessive and rapid swings in mood; worrying unreasonably about things that do not matter; inability to feel sympathy for other people; feeling tired and anger.

Cognitive responses are increased distractibility and decreased concentration.

Behavioural responses of stress are over eating, alcohol consumption, smoking, dependence on drugs, etc. In stressful situations one craves fried and oily, high sugar and high salt foods.

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*Source: The Times of India, July 2017

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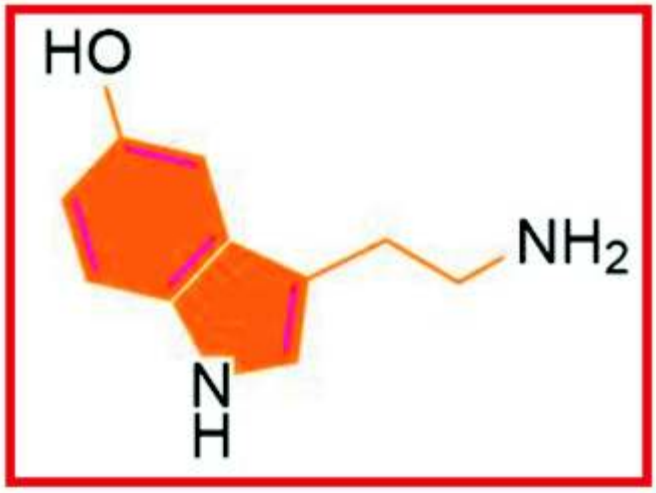


Figure-2: Chemical Structure of Serotonin

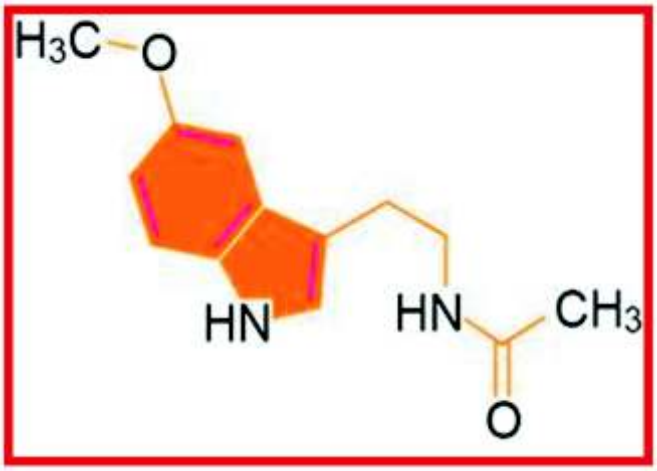


Figure-3: Chemical Structure of Melatonin

Stress and Sleep Deprivation

Stress also precipitates sleep deprivation and can result in insomnia in the long run. A recent survey in India shows that the average Indian sleeps for just 6.5 hours a night, while 46% Indians get less than 6 hours of sleep per night, against the requirement of 7-8 hours per night. A lot of this sleep deprivation can be attributed to the urban work culture with longer working hours and the use of gadgets (TV, mobiles, tabs or laptops) into late hours of the night.

The Stress & Diet connection

The neurotransmitter serotonin improves the ability of humans to cope with stress and anxiety. In the human brain, serotonin is involved in numerous physiological functions, including sleep, pain, appetite and mood. Serotonin is also the precursor of the neurohormone Melatonin secreted from the pineal gland.

Together these two are known to induce relaxation, improve mood, regulate sleep and appetite and even act as antioxidants in the body.

The melatonin signal forms part of the system that regulates the sleep-wake cycle (Circadian Rhythm). Therefore, tryptophan indirectly relieves stress by also improving the sleep patterns. The melatonin signal forms part of the system that regulates the sleep-wake cycle (Circadian Rhythm) by chemically causing drowsiness and lowering the body temperature.

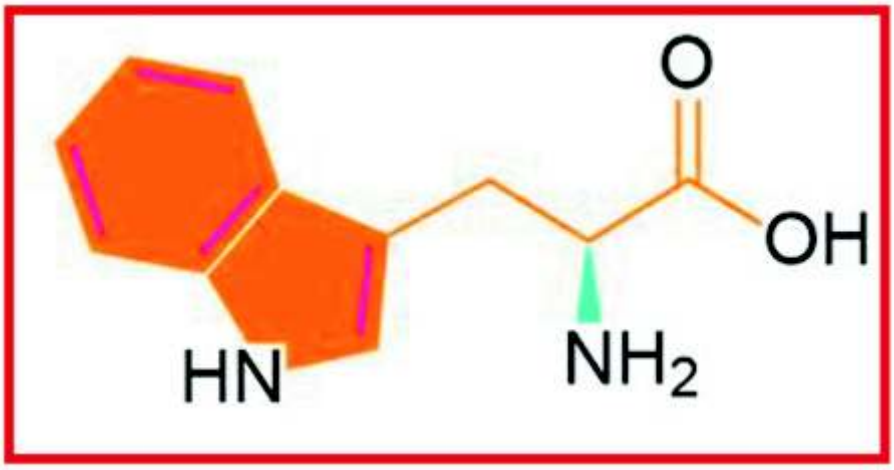
Tryptophan and Stress Management

L-tryptophan, an essential amino acid is the sole precursor of the neurotransmitter, serotonin, in the brain. In an average person's diet, there is usually an adequate amount of tryptophan, as per the RDA guidelines. However, the availability of tryptophan for production of serotonin is dependent on it crossing the blood brain barrier to reach the brain.

Availability of Tryptophan for Serotonin and Melatonin production

In the bloodstream, L-tryptophan has to compete with other Long Chain Neutral Amino Acids (LNAA), namely, isoleucine, leucine, phenylalanine, tyrosine, and valine, for the Blood Brain Barrier (BBB) transporter.

Figure-4: Chemical Structure of Tryptophan



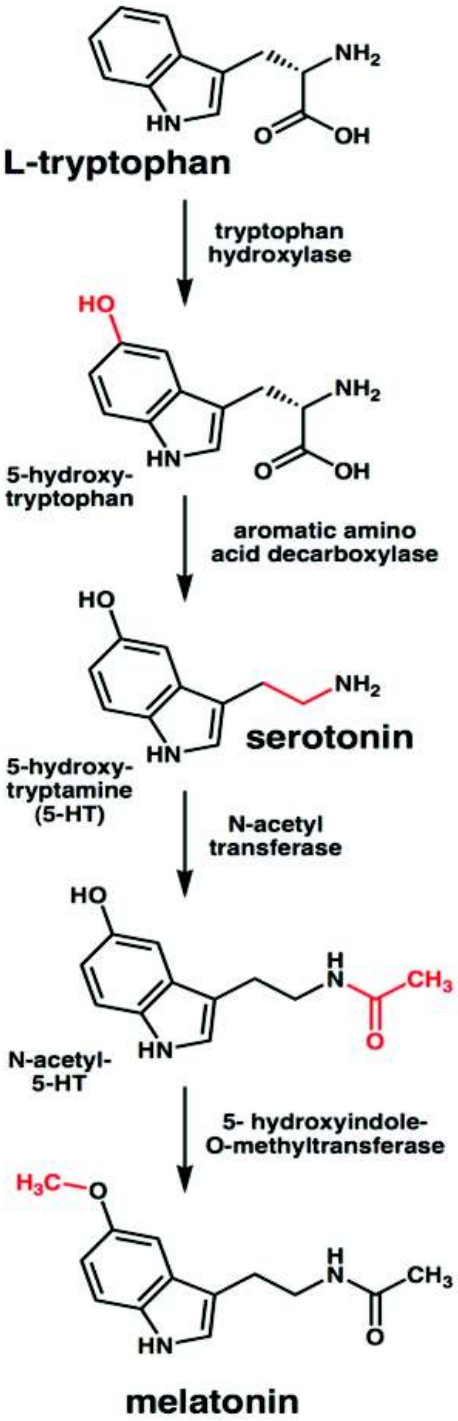


Figure – 5: Process of Conversion of Tryptophan to Serotonin and Melatonin

Due to the competitive transport among the LNAAs, the bioavailability of tryptophan for transport across the BBB is best expressed by the ratio of tryptophan to the sum of its competing amino acids. Therefore, changing the ratio of tryptophan to the other competing large neutral amino acids can significantly affect concentrations of brain tryptophan available for serotonin synthesis.The L-tryptophan/Long chain Neutral Amino Acids (LNAA) ratio represents the relative availability of plasma L-tryptophan for crossing the blood-brain barrier and is thought to be the best indicator of brain serotonin synthesis.

Certain foods that are rich in tryptophan and have the optimum ratio of tryptophan to the neutral amino acids are known to enhance the production of the neurotransmitter serotonin in the brain and secretion of the neurohormone Melatonin from the pineal gland.(Sandyk,1992)

How to increase Tryptophan availability in the diet?

It can be suggested, based on research, that foods having a higher tryptophan/ LNAA ratio increase the availability of L-tryptophan in serum for serotonin synthesis and crossing the blood-brain barrier.This hypothesis was explored in a research conducted with class X school children by including such tryptophan available foods in their diet and providing stress management training alongside. (Rohini and Yegammai, 2012).

The formula that is used for estimating the Tryptophan / LNAA Ratio of a particular food item is as follows:

$$\text{Tryptophan/ LNAA ratio} = \frac{\text{Amount of Tryptophan}}{\text{leucine + iso-leucine + valine + phenylalaline + tyrosine}}$$

The amount of each amino acid present in the food item was calculated using the Table of nutritive value of common Indian foods (Gopalan et al., 2007), wherein the amount of amino acid present in each food item was given in mg/g of Nitrogen, which was then multiplied with the value of total nitrogen/100g of food to get the amount of that amino acid present in 100g of that food item.

Foods that were found to have a higher Tryptophan/ LNAA ratio and could help in improving serotonin production are listed below:

- Sweet Potato
- Tapioca
- Potato
- Linseed
- Onion
- Cashew nut
- Strawberry
- Drumstick leaves
- Colocasia
- Cabbage
- Bajra
- Cauliflower
- French beans
- Pumpkin
- Banana
- Spinach
- Fenugreek leaves
- Amaranth
- Beetroot
- Oatmeal
- Wheat whole
- Agathi
- Mutton
- Rice

- Avocado
- Soyabean
- Yam
- Milk
- Ragi
- Sesame seeds
- Black gram dal
- Egg (hen)
- Walnut
- Peas (dry)
- Groundnut
- Brinjal
- Ladies Finger

By including these easily available common foods regularly in one's diet, it would facilitate the production of serotonin and melatonin in the body. This intervention resulted in significant reduction in overall stress and anxiety levels; as well as improved sleep patterns in the adolescents who were part of the study (Rohini and Yegammai, 2012).

The Ayurveda Connection:
Ayurveda (translated - "Science of Life") the ancient Indian System of Health Care represents experiential wisdom of over 5000 years. Ayurveda describes 3 kinds of "Aahar" or diet – "Satwik" or calming in nature "Rajasik" or rich in nature and "Tamasik" or aggravating/ excitatory. The "Rishis" or sages took "Satwikaahar" consisting of "anna, kanda, moola, phala" (grains, vegetables, roots and fruits) and lived for a hundred years. In today's parlance, this represents a moderate caloric diet (which causes the least oxidative stress), with high fibre, low fat, low sodium, high potassium & minerals and plenty of antioxidants (Lele, 2012).

For years we have heard our elders say,
"Jaisakhaye Ann - waisa hoye Mann"

This simply means that the type of food you eat determines the type of temperament you shall possess.

In the current perspective, it has been well established that certain foods stimulate the secretion of relaxing chemicals (serotonin, endorphins), while certain others not only suppress the secretion of these relaxing chemicals, but also induce a stressful response in the body.

It is however imperative to understand that the human body and mind function as a unified system and are in close sync with each other. It is essential to learn techniques and methods to manage stress by calming the mind through meditation, breathing techniques and yoga; and including regular exercise in one's routine, to achieve maximum benefit. To address stress management through diet or meditation in isolation is not prudent, considering the complexity of the human system.

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HOW TO REDUCE TRANS FATS IN OILS AND FATS TO MAKE THEM HEALTHIER

By
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Technical Services,
Customer Innovation Centre,
AAK Kamani Pvt Ltd

Importance of oils and fats in our diet

Oils and fats form an integral part of any healthy and balanced diet. Besides playing a vital role in nutrition, they also enhance the taste, mouth-feel and texture of food, thus providing eating pleasure and a feeling of satiety. Though excess of oil/ fat is considered the culprit for many life style diseases, the right quality and quantity of fat is essential for normal functioning of our body. Excess intake and the wrong kind of fats also affects the blood cholesterol levels which is directly linked to heart disease, the most common being the coronary heart disease or CHD. As per WHO (World Health Organization), physical inactivity is also a preventable risk factor for CVDs (Cardio vascular diseases) and the main reason for physical inactivity is a sedentary lifestyle. Higher work stress and unhealthy eating habits also contribute towards growing incidences of lifestyle diseases.

Trans fats and its nutritional significance

There are four basic types of fats: monounsaturated fats (MUFAs), polyunsaturated fats (PUFAs), saturated fats (SAFAs) and trans fats. MUFAs and PUFAs are good fats; Trans and to some extent SAFAs are bad fats. Too much of SAFAs tend to raise LDL (bad) cholesterol levels. MUFAs help to lower LDL (bad) cholesterol and maintain HDL (good) cholesterol (1). PUFAs help to reduce LDL (bad) cholesterol, but too much of it, can also lower HDL (good) cholesterol. Trans fats which are formed during the process of hydrogenation (also called synthetic trans fats), tend to increase the LDL level (bad cholesterol) and decrease HDL (good cholesterol), which may lead to cardiovascular disease (CVD) (2). Trans fats also increase triglyceride levels in the blood, adding to our risk of heart disease. Consumption of high amount of trans fats is also associated with high risk of developing diabetes, obesity, immune system dysfunction. Hence Trans fat is considered as the most harmful type of fat. Partially hydrogenated vegetable oils (PHVOs) contain high amount of these trans fats.

Another source of trans fats which is natural trans-fat is from dairy and meat products. The concentration of trans fats in these fats is usually low, from 3–8%, and these trans fats are different from those formed by hydrogenation of vegetable oils. These trans fats are formed because of the bacterial metabolism of the fat in the rumen of the ruminant animals. The health effects of natural trans fats from ruminants and whether they are better than or the same as the synthetic trans fats from hydrogenation process are not fully resolved.(3). Refined oils also have been found to contain trans fats up to 1–2%, due to the higher temperatures employed in the deodorization step. Hence, it may be necessary to modify the deodorization step to ensure that trans fats are within the specified limits in the refined vegetable oils.

In the 1990s, research began identifying the adverse health effects of trans fats formed during hydrogenation of oils. These are present in partially hydrogenated (PHVOs) fats like Vanaspati, margarines and shortenings and are commonly used to make pastries, pie crusts, biscuits, pizza dough, cookies, crackers as well as fried foods like doughnuts, etc.

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Current Scenario and Regulations on Trans fats

Globally there has been a trend to produce trans free/ low trans containing food products. The American Heart Association (AHA) and the World Health Organization (WHO) recommend limiting the amount of trans fats intake to less than 1 percent of total daily calories. That means if average individual needs 2,000 calories a day, no more than 20 of those calories should come from trans fats. That's less than 2.2 grams of trans fats a day.

The Food Safety Standards Act of India (FSSAI) had issued notifications to amend the Food Safety Standards Regulations 2011 and has put a limit of 5% maximum for trans fats in Vanaspati, Bakery Shortening and Margarine in 2015. It is now mandatory to declare the trans and saturated fats' contenton the labels of packaged foods along with other nutritional information.

FSSAI now plans to bring down the trans-fatty acids content in edible oils and fats to 2% from the current 5% in a phased manner by 2022 (4). WHO has urged countries to eliminate industrially-produced trans-fat from the food supply by 2023 (5). Across the world, countries like Denmark, Australia, Canada, etc. have already looked at various food policies that focus on trans-fat and in some cases strictly imposing limits on the content of trans-fat in their food products.

Challenges

Trans-fatsare a type of fat which are formed during the process of hydrogenation i.e. they are formed artificially when unsaturated fats undergo a process of hydrogenation.

Hydrogenation process is carried out to increase the melting point of the vegetable oils, which are normally liquid at room temp and have low oxidative stability. This process increases the stability, resistance to oxidation, and shelf life of vegetable oils. The liquid oils are converted to solid fats and during this process, some part of the liquid oil is converted to trans-fat, which remains solid even at room temperature. A solid consistency is necessary for the manufacture of shortenings and margarine. In earlier days several restaurants and fast-food joints used hydrogenated oils or Vanaspati which contained high amount of trans fats to deep-fry foods.

Healthy alternatives to trans fats is the need of the hour today. Oils and fats manufacturing companies are now gearing up to market low trans or trans free products. Nowadays, many fast food manufacturers have undertaken extensive developmental efforts to reduce or even eliminate trans fats in foods.The demand of consumers seeking clean label is increasing and hence the need to develop trans free products. Vegetable fats which are trans free can act as natural leavening agents and can substitute many of the additives and chemicals that are being used in food formulations.

How to reduce/eliminate trans fats – Strategic approach

As trans fats get gradually phased out, we must look at healthier options to replace trans fats. Any product that replaces trans fats should give the same or similar functional characteristics. Apart from performance we should also consider other factors like economics, availability, regulatory and last but not the least food safety. Much research is currently being conducted to develop new, healthier fats and oils for food production. They must therefore be modified chemically and or physically to change their properties. The following alternatives can be looked at to reduce or eliminate trans in oils and fats.

1) Modification of the hydrogenation process

It is now a well-known fact that partial hydrogenation produces trans fats. The process of hydrogenation depends on certain factors like temperature, agitation, hydrogen gas pressure, type of catalyst and catalyst concentration. If these parameters are modified, it is possible to manufacture low trans fats. There is also a possibility to fully hydrogenate the oils to saturated fats but this would make the product waxy and the solid fat content would be also very high to be used in any food formulation.

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Hence this product would need dilution with soft oils or liquid oils to get the proper consistency. All these modifications may prove to be expensive on a commercial scale and moreover even if the product contains no trans fats, mention of "hydrogenated vegetable oil" on the product label is still mandatory, hence acceptance of this approach would be limited.

2) Interesterification

This is a widely accepted modification technique as a replacement to the hydrogenation process. Interesterification involves an exchange of acyl group among triglycerides. Acyl groups may exchange positions within a triglyceride or among triglyceride molecules.

Unsaturated vegetable oils are blended with highly saturated oils under specific conditions. Since there is no hydrogenation process involved, there is no formation of trans fats. Palm oil is the most suitable oil for this process because of its versatility, competitive pricing and availability.

In the food industry, interesterification can be carried out using a chemical catalyst or an enzyme. Sodium methoxide is generally used as a catalyst in chemical esterification, while lipases are used in enzymatic interesterification. Chemical interesterification is a random reaction while enzymatic interesterification can be random or specific. The physical properties like melting point, texture, solid profile, hardness and crystallization changes during the process. Many food industries are opting for interesterified fats because of the low or no trans content and an additional benefit from the labelling declaration point of view. But this modification technique is not without any downsides. The oxidative stability of the fats along with commercial viability should be investigated. Ifthere are food formulators who want to go for a 'non-palm oil' claim, then selection of oils becomes a challenge to get the desired functional attributes.

3) Fractionation and Blending

Fractionation is a separation technique wherein solid portion and liquid portion of the oil is separated. Liquid oil is called Olein and solid portion is called Stearin. Fractionation improves the clarity of oil at ambient temperatures. Oils in the natural form are all in cis-configuration and hence devoid of trans and on fractionation, would yield trans-free products. These liquid and solid fractions can be used for further blending and formulating the products of desired consistency. The palm oil industry uses oil fractionation process to modify and improve the functionality of palm oil. In the case of regular blending, different base-stocks are mixed together to obtain a specific composition and consistency in the final product. These base-stocks can be hydrogenated oils (fully or partial), interesterified oils and fats or even fractions obtained post fractionation process.

4) Choice of specific oils

Saturated vegetable oils e.g. Palm oil are less harmful than trans fats and are a better choice for the food industry. The risk of cardiovascular disease is reduced when trans and saturated fatty acids are replaced with cis unsaturated fatty acids especially monounsaturated fatty acids. Use of monounsaturated oils like canola, groundnut, high oleic sunflower oil is a healthier alternative than use of oils and fats containing considerable amount of trans and saturated fatty acids. Blended oils can also be used in specific ratios which again depends on the end-product functionality interms of taste, shelf-life and cost implications. Different functionalities require specific compositions that are usually not found in a single fat or oil. Ideal fat for good health is the one which contains a good balance of linoleic/ alpha-linolenic acids (n-6/ n-3) both of which are essential fatty acids and cannot be synthesized by the human body.

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The way forward

To address the alarming rise of lifestyle diseases like diabetes, obesity, cancer etc in the country, a good place to start would be to consider the right quality and quantity of the fat intake in your food. There is also an urgent need to spread awareness about the benefits of fat and how exactly to gain from its inclusion in your diet. Government of India through FSSAI is taking active steps to reduce the trans-fat consumption amongst Indian population by making the regulations very stringent and bringing down the trans content in oils and fats in a phased manner and the food industry is supporting FSSAI in this cause. There is also a need for educating the consumers to read and understand food labels. New processing techniques and technologies along with novel ingredients are now being developed by formulators in the field of oils and fats as viable substitutes that will have the necessary performance.

To lead a healthy and fulfilling life, it is best to cut down trans fat intake, switch to healthier options, have a balanced diet and supplement it with regular fitness exercises. Regular physical activity reduces the risk of heart attacks and strokes. A healthy dietwithout trans, along with regular exercise and maintaining desired body weight helps in stress management thus, helping in combating other lifestyle diseases.

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5. WHO REPLACE TRANS FAT - an action package to eliminate industrially-producedtrans-fat from the global food supply

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DIABETES & EATING FRUITS

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Fresh fruits are healthy, nutritious foods and good source of vitamins, minerals, phytochemicals and fiber.

Because fruits are high in dietary fiber and fructose, they do not cause drastic changes in blood sugar levels when eaten in moderation. Fruit contains natural sugars which is a mix of sucrose, fructose and glucose. Fructose is only harmful in excess amounts, not when it comes from fruit. It is very difficult to consume excessive amounts of fructose by eating whole fruits. It is much easier to consume excess sugar from foods and drinks that contain " Free Sugars". These are sugars which are added to food and drinks by food companies, cooks or consumers.

Blood Sugar and Fruit :

Fructose is the sugar found in all fruits. Average 4-8 gm of fructose is found in fruits. Reducing sugars (mixture of fructose and glucose): Sucrose are main source of carbohydrates in fruits. Fruits are high in dietary fiber and fructose, this makes them a low glycemic –index food. The glycemic index being a measurement of how much carbohdyates affect blood sugar levels.

However sweeter fruits, such as melons, and dried fruits which have higher sugar content / serving are medium glycemic index.

Eating fruit is good for health:

1. Fruits are excellent source of fiber; average fruit contains 3-4 gm of fiber
2. They also contain micronutrients, antioxidants for good health

Indian dietary guidelines recommends 100-200gm of fruit /daily.

Fructose metabolism:

Fructose stimulates only modest insulin secretion and does not require the presence of insulin to enter the cells. Rapidly taken up by liver cells, fructose is rapidly converted to fructose -1-phosphate and bypasses the early, rate-limiting steps of glucose metabolism. This is mainly converted to lactate, glucose and glycogen. Glucogenesis from fructose is increased by starvation and poorly controlled diabetes. Increased fructose activity enhances lipogenic enzymes and increased triglyceride (fat) metabolism.

Body tolerates fruits sugar much more than the high-fructose corn syrup.

Mango and Diabetes:

100 gm of Mango has 14.6 gm of sugar composed of 9.9% of sucrose, 0.7%, glucose, and 2.9% fructose.

1 medium size mango (size of a tennis ball) has following nutrient composition:

Nutrient	Quantity	Uses
Calories	100 kcal	Energy
Carbohydrates	23 gm	Energy
Fiber	3 gm	Satiety and more
Vitamin C	100% of RDA*	Immunity, Antioxidant
Vitamin A	35% of RDA	Hair, Skin, Eyes, Cell Growth
Folate	10% of RDA	Nervous system and other beneficial enzymatic reactions in body
Vitamin B6	10% of RDA	Healthy brain function, immune strength etc
Vitamin K	8% of RDA	Blood coagulation
Copper, Calcium and Iron	In small amounts	Co-factors in enzymes

*RDA : Recommeded Dietary Allowance

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BusinessLine

High sugar, salt content: FSSAI sticks to its stance on labelling norms

Our Bureau | BENGALURU | Updated on June 27, 2019 | Published on June 27, 2019

DownToEarth

FOOD

FSSAI's new draft regulation for food safety will promote informed consumer choice

The mandatory colour coding for sugary and salty foods can prevent people from developing non-communicable diseases like hypertension, diabetes

NEXT BLOG ›

Sonal Dhingra
Monday 08 July 2019

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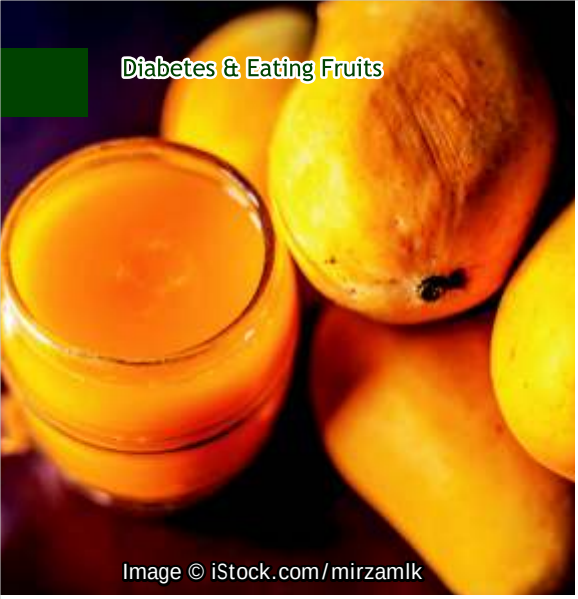


1. Myth: Eating Mangoes will give weight Gain

Fact: It has good amount of sugar i.e. 25 gm in 1 med size mango. It has only 60-100 kcal. No fat. So the amount of mango we eat at one time makes you gain weight as you load too much of fruit sugar. One mango at a time for weight conscious people is not harmful.

2. Myth: Eating too much mango leads to excessive heat in the body

Fact: Eating too much mango upsets the tummy or leads to skin eruptions because it is high in sugar. It's the same with other sugar-heavy fruits as well. Therefore remember, moderation is key.

3. Myth: Diabetics cannot have Mango

Fact: As Mangoes are rich in sugar. If had during the day like 11.00 am and 5.00 pm the sugars are metabolised. Mangoes with meal increase the total glycemic load and hence can disturb sugar metabolism. One mango at right time and quantiy could be consumed thrice a week. This is a generalised thought . If increased sugar patients need to take expert advise. Special precautions for diabetics about eating fruits.

How to eat Mango for optimum nutrition

1. Fresh cut mango: 1 cup about 150 gm
2. Squeezed mango (Aamras): 1 cup
3. Milk shake: no added sugar and low fat milk: ½ mango and 150 ml milk

Avoid eating mango with added sugar and salt as nature has done its best to provide adequate nutrition in the fruit.

Safety Profile:

To be avoided in patients taking Warfarin, and severe diabetics. King of fruits is full of nutrition. Eat 1-2 medium size mango daily to make the best store of nutrients.

We should enjoy seasonal fruits. Learning how, when and how much fruit will help diabetics to get the best nutrition of the fruits rather than not to eat fruits.

SUGAR REDUCTION TRENDS IN THE PROCESSED FOOD INDUSTRY IN THE WEST

By
Dr. V. Krishnakumar,
Managing Director, Giract
www.giract.com

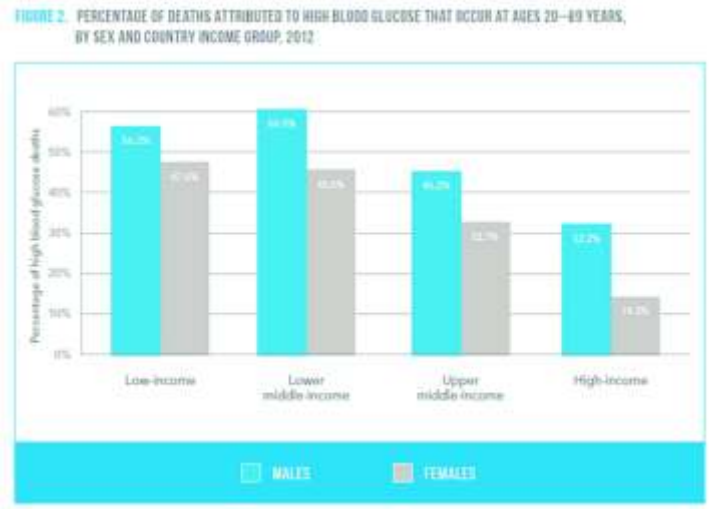
Image © iStock.com/bogdandreava

Sucrose (which is often called as sugar) is the most abundant disaccharide available in nature. All green plants are known to produce sugar through photosynthesis, which is the process plants use to transform sun's energy into food. Of all plant types, sugar beets and sugar cane possess the highest quantities of sugar, which is why they have become the most efficient choices from which sugar is extracted today.

Sugar has always been the gold standard when it comes to choosing a sweetener in the processed food industry. It has an 'ingredient' status in the EU legislation (as opposed to an 'additive' with an E number) and consumers have long been exposed only to sugar as the sweetening ingredient due to its outstanding technical properties including sweetness, flavour, bulking, texture, shelf-life, freezing-point depression, colour, moisture retention, etc. Further, sugar production across the globe, from cane in the south and beet in the north, have steadily increased over the years leading to a significant drop in global prices. The recent sugar reform in the EU has made sugar the most attractive sweetener from both technical and cost points of view.

Source: USDA

However, the excessive calorie consumption by the western population over the last 50 years has led to high obesity levels and numerous medical issues such as type 2 diabetes, high blood pressure, cholesterol, heart disease, etc. Governments are increasingly worried about the economic and social burdens due to this phenomenon. The World Health Organization (WHO) now recommends that adults and children reduce their daily intake of free sugars to less than 10% of their total energy intake, and that a further reduction to below 5% or roughly 25 grams (6 teaspoons) per day would provide additional health benefits.



Globally, consumers are becoming aware of the problems due to excessive sugar consumption. The key consumer dynamics noted by Giract in its recent analysis of the global sweetener markets are as follows:

- Health concerns such as diabetes and obesity are still the main drivers for the sugar-free trend
- Sugar reduction is still a macro-trend. Younger consumers are avoiding artificial sweeteners and are more likely to go for natural sweeteners
- The role of sugar-free products has become more important in recent years due to the rising levels of obesity and diabetes, especially in the aging baby boomer population
- Thirteen percent of people follow a low sugar diet, 5% follow a diabetic diet in the US
- Many brands are building on their existing relationship with this consumer group by providing food, health and wellness information and a community platform for like-minded consumers
- Sugar-free products have other meaningful health benefits such as weight control (low-calorie and zero calorie), oral health (polyols preventing tooth decay), gut health (lactitol as a laxative), vitamins and minerals (sugar-free gummy nutritional supplements) and energy (dextrose tablets)
- This trend is likely to continue, though the extent to which sugar-free and added health benefits will grow is still unclear. The sugar-free arena may thus become the preferred carrier of a wide range of health-related benefits
- In addition to the low calorie and sugarless trend, products and sweeteners termed as 'natural' are seeing an increase. Givaudan is also exploring flavour enhancement as a means of sweetness by using certain flavours from onion and celery. The aim is to introduce less sweetness at an early age so that consumers become habituated to food and beverages with lower sweetness, in hopes of countering childhood obesity

Hence, there is a strong move by major food companies across the western world to reduce the quantity of sugar used in the production of foods. Some examples are as follows:

- PepsiCo has pledged to reduce 30% sugar in its beverages
- Unilever's RTD tea, iced tea, milk tea products targeted to reduce 25% sugar by 2020
- 28% of Danone's volumes are now without added sugar
- Nestlé has already removed 40kt of sugar since 2014, and has committed to remove 18kt of sugar from products sold in the EU by 2020.

The announcement regarding sugar reduction of 25 to 30% is now coming from companies in the developing world as well.

Since sugar provides numerous technical and organoleptic characteristics to processed food, it is not easy to replace sugar. When starch or other such ingredients are used to replace sugar, the reduction in calories may not be evident. On the other hand, consumers' reticence towards 'artificial' ingredients/additives would mean that many of the high-intensity sweeteners available in the market may not be automatic choices, apart from the fact that they do not provide the necessary bulk.

In view of such significant changes, how should sugar and sweetener producers react? Consumers are demanding for 'natural' products without offering any clear definition of 'natural'. Sugar, which was seen as a 'natural' product by the western consumer till recently, is no longer perceived in that manner.







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- Propylene Glycol Esters
- PGPR and other
- Speciality Emulsifiers
- Cold water dispersible
- Emulsifier system
- Datems (Powder & Liquid)
- Ammonium Phosphatide
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- Vital wheat Gluten
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The beverage sector is the main target of attack by the various governments. For example, some cities in the US have introduced sugar-sweetened beverage (SSB) taxes. SSBs are taxed between USD 1-2/oz to induce a reduction in their consumption. The implementation of the sugar-sweetened beverage tax has resulted in an increase in the consumption of dairy-based beverages and water as low-sugar alternatives. Since 2015, eight states in the US have implemented the sugar sweetened beverage (SSB) tax, as studies have shown that a USD 1/oz tax could reduce consumption by 15% in adults, decreasing new cases of type 2 diabetes by 2.6% and obesity by 1.5%. Reformulation of drinks is relatively easy and thus manufacturers have been reformulating drinks with sugar substitutes and high intensity sweeteners to adhere to current consumer trends such as health consciousness, diabetes and the use of natural sweeteners.

The confectionery category has been facing pressure to reduce fat and calories, although product reformulation is difficult due to the specific functional and organoleptic requirements of their ingredients. Therefore, incorporation of new ingredients and ingredient innovation is possible in this category. For example, Nestlé decreased the sugar content of Milkybar by 30% by altering the sugar crystals and markets the product as Milkybar Wowsomes. Sugar-free/low-sugar concept in chocolates is still not more prevalent. A clean tasting sugar alternative has not yet been found for chocolate, which serves as the major limitation for use of sugar alternatives in this category. The use of sugar substitutes dominates in chewing gum category. With sugar-reduction trend gaining focus in the EU28 region, confectionery producers are expected to test new sweeteners on the market which might enable them to replace sugar.

Many 'natural' sweeteners such as erythritol, allulose, stevia, monk fruit, etc. are gearing up to replace sugar and thus gain market share in the overall sweetener market. There are other such options as well. For example, Danone uses evaporated cane juice as a partial replacement of sugar since the former is also viewed as a 'natural' product as compared to white sugar, although there is really no difference in the calorie content of the two products. Another option for food producers is to use brown sugar instead of white sugar since the brown sugar is seen to be more 'traditional' and 'natural' by consumers, but clearly with no difference in calorie content.

Brown sugar (also known as soft sugar or Demerara in the UK) is a crystallised mass of fine grain sugar (sucrose) crystals that are enveloped with a retained film of highly refined, dark colour, cane molasses. The product is normally available in two colours - light/golden brown and dark brown. The product is characterised by the presence of 2 to 3% of invert sugar. Distinction is also often drawn with regard to crystal size.
- Light brown sugar with a fine crystal size - called also the Fourths Sugar, because this is sugar separated after the fourth step in the refining process.
- Demerara - with a medium gold colour and bolder crystal size
- Very dark brown sugars, e.g. Muscovado (probably with the darkest colour, Primrose, Barbados, Malawi sugar,...)

These sugars were originally produced as by-products of the sugar production.

Today, brown sugar can also be produced by mixing white sugar (cane or beet sugar) with cane molasses (mingled sugars). These brown sugars have the advantage that the quality is more controlled, more consistent than natural brown sugars which have been processed in countries where quality systems are not very sophisticated. On the other hand, they are usually somewhat hygroscopic, not so free flowing and definitely deselected for dry products such as cereals.

Brown sugar is essentially used in the bakery (cake/pudding) and confectionery (toffee/fudge) sectors. Significant quantities are also used in the breakfast cereal sector and a few other food markets and in the pharmaceutical sector. Brown sugar is also sold as a table top product and is generally seen as a 'natural' sugar.


Image © iStock.com/whitewish

In Giract's latest market study on sweeteners, which examines the global volumes and trends of caloric bulk sweeteners (including sugar), low-calorie bulk sweeteners and high-intensity sweeteners, sugar reduction as well as the move towards 'natural' sweeteners are clearly identified.

However, these are all at best temporary solutions against this huge pressure faced by the processed food industry to reduce/remove sugar. Limiting the consumption of sugar as well as balanced and healthy eating are necessary, and the food industry should take a significant effort in educating the consumer on these important issues. Imposing sugar tax and bringing other legislative measures can only change consumer behaviour marginally. Transparent and honest dialogue with the consumer and the governments is the way forward for ensuring sustainable business opportunities for the sugar industry.

The situation in India is rather special. India is often called the diabetes capital of the world. The World Health Organization (WHO) estimated that 69 million people in India had diabetes in 2015 and that 98 million people may have type 2 diabetes by the year 2030. With the increasing demand for insulin across the world, many people in India may not have access to insulin. Thus, all care should be taken to reduce the number of diabetes patients in India in the coming years. The strong cultural and religious link to sugar consumption in India makes it difficult to encourage the Indian population to reduce sugar intake.

An interesting article from Seema Gulati and Anoop Misra* provides a list of commonly consumed food articles in India containing natural or added sugars:

The per capita consumption of sugar in India was 19 kg in 2013/14 based on the total consumption data from the National Federation of Sugar Factories at 24.4 million tons. However, the total consumption data in 2017/18 at 25.4 million tons also results in the same 19 kg per capita estimation. It is not immediately clear if the above estimates are accurate, but all other indicators show an increase in per capita consumption of sugar in India over the recent years. In spite of such data anomalies, the rapidly increasing epidemic of type 2 diabetes should motivate all the stakeholders to re-examine sugar consumption patterns in India across processed foods, foods made at home as well as the burgeoning food service sector.

Main Meals	Snacks	Beverages	Others
rice, wheat,	Indian sweets (halwa, kheer, etc.),	sugar cane juice,	sweet chutneys,
buckwheat,	kulfi,	Shikanjvi,	pickles,
oats, millets,	chikki,	sweetened lassi (buttermilk),	aamras,
barley,	puddings,	sharbat,	murabbas,
breads, etc.;	fruit cakes,	aam panna,	honey,
sugar/jaggery	cookies,	milkshakes,	khandsari with ghee,
stuffed Indian bread,	ice creams	fruit juices,	jams,
yogurt,		sugar-sweetened beverages (SSBs), etc.	tomato ketchup
vegetables, etc.			

Source: Seema Gulati, Anoop Misra

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REGULATORY ROUND UP

By
Dr. N. Ramasubramanian,
VR Food Tech Private Limited
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Dear Readers

Hope you have sent in your suggestions and recommendations on the draft Labelling and Display Regulation. Many industry bodies including PFNDAI have deliberated in detail and their recommendations might have been submitted. Hope the Authority will give due consideration to the suggestions made. FSSAI, unlike many other regulatory bodies, does not publish the comments and also does not give justifications for their acceptance or rejection. The process is not completely transparent which leaves many stakeholders frustrated. Publicizing the comments and the scientific justification of their rejection or acceptance would go a long way in building confidence in the stakeholders.

Please find below FSSAI notifications, orders, etc.

Additional FSSAI approved laboratories in Kerala and West Bengal.

Final notification of regulation governing Recovery and Distribution of Surplus food. Food may be distributed to the needy but must be safe. The regulation details the responsibilities of food business operators and organizations involved in the distribution of surplus foods to the needy. It also details the labelling and mandatory documentation required.

Final notification on the standards of Chia seed oil and its fatty acid composition

Final notification on related to revision of existing standards of coconut milk and coconut cream, standards for dried oregano , pimento, Bay Leaf (Whole and Powder), Dried Mint, Dried Rosemary

Draft notification covering
- Standards for monk fruit juice
- Amendment in the standard of identity of bread, biscuits, Rawa, Maida
- Draft standard for breakfast cereal
- Draft amendment in spices
- Draft amendment in Honey, Sucralose
- Review of gluten free and low gluten standards
- Trehalose in more products
- Permitting additives and processing aids in new food categories
- Introduction of microbiological standards for egg and egg products

Image © iStock.com/ memoangeles

Draft notification proposing to restrict the total polar matter in used oil to 25%

Draft notification amending the standards of Alcoholic Beverages.

FSSAI issues a list of edible truffle species that are permitted to be imported.

FSSAI permits the use of "Transfat Free" logo in products which complies with Claim and Advertisement Regulation, 2018 published in November 2018. The order depicts the design, size and the colour combination.

FSSAI has issued an order prohibiting packing of toys and other gifts inside a food package with special emphasis on foods consumed by children. This is a good food safety measure. The order also requires that the shape and colour of the toy should be such that it is not mistaken for the food.

FSSAI through an order amends the regulation on Contaminants, Toxins and Residues and bans the use of antibiotic colistin and its preparations in animal husbandry.

FSSAI vide its letter dated 08 Aug 2019 urges all the food business operators who consume or use more than 50 kg of cooking oil to maintain records and also dispose the used cooking oil to authorized dealers. The letter lists the bio-fuel dealers enrolled with FSSAI.

FSSAI directs all food business operators holding central license and in sectors like dairy and dairy products or meat and meat products or fish and fish products or egg and egg products or foods intended for particular nutritional use (Health supplement) or prepared foods (catering) must get their establishment audited for food safety. The audit shall be carried by the FSSA authorized agencies.

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RESEARCH IN HEALTH & NUTRITION

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Low vitamin K levels linked to mobility limitation and disability in older adults

Science Daily June 13, 2019

Low levels of circulating vitamin K are linked to increased risk of mobility limitation and disability in older adults, identifying a new factor to consider for maintaining mobility and independence in older age, according to a study led by researchers at the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University.

The study, published online in May in advance of print in the Journal of Gerontology: Medical Sciences, is the first to evaluate the association between biomarkers of vitamin K status and the onset of mobility limitation and disability in older adults.

"Because of our growing population of older people, it's important for us to understand the variety of risk factors for mobility disability," said Kyla Shea, first and corresponding author and a nutrition scientist in the Vitamin K Laboratory at the Jean Mayer USDA Human Nutrition Research Center on Aging (HNRCA) at Tufts University.

"Low vitamin K status has been associated with the onset of chronic diseases that lead to disability, but the work to understand this connection is in its infancy. Here, we're building on previous studies that found that low levels of circulating vitamin K are associated with slower gait speed and a higher risk of osteoarthritis," she continued.

The new study examined two biomarkers: circulating levels of vitamin K (phylloquinone) and a functional measure of vitamin K (plasma ucMGP). Using participant data from the Health, Aging, and Body Composition Study (Health ABC), the study found that older adults with low levels of circulating vitamin K were more likely to develop mobility limitation and disability. The other biomarker, plasma ucMGP, did not show clear associations with mobility limitation and disability.

Specifically, older adults with low circulating vitamin K levels were nearly 1.5 times more likely to develop mobility limitation and nearly twice as likely to develop mobility disability compared to those with sufficient levels. This was true for both men and women.

"The connection we saw with low levels of circulating vitamin K further supports vitamin K's association with mobility disability," said senior author Sarah Booth, a vitamin K and nutrition researcher, and director of the HNRCA. "Although the two biomarkers we looked at are known to reflect vitamin K status, biomarker levels can also be affected by additional known or unknown factors. Further experiments to understand the mechanisms of biomarkers and vitamin K and their role in mobility are needed."

The study used data from 635 men and 688 women ages 70-79 years old, approximately 40 percent of whom were black, who participated in Health ABC. In Health ABC, mobility was assessed every six months for six to ten years through annual clinic visits and phone interviews in the intervening time. For the present analysis, the researchers defined mobility limitation as two consecutive semi-annual reports of having any amount of difficulty either with walking a quarter of a mile or climbing 10 steps without resting, and mobility disability as two consecutive semi-annual reports of having a lot of difficulty or inability to walk or climb the same amount.

Circulating vitamin K levels reflect the amount of vitamin K in the diet. The best food sources of vitamin K include leafy greens such as spinach, kale and broccoli and some

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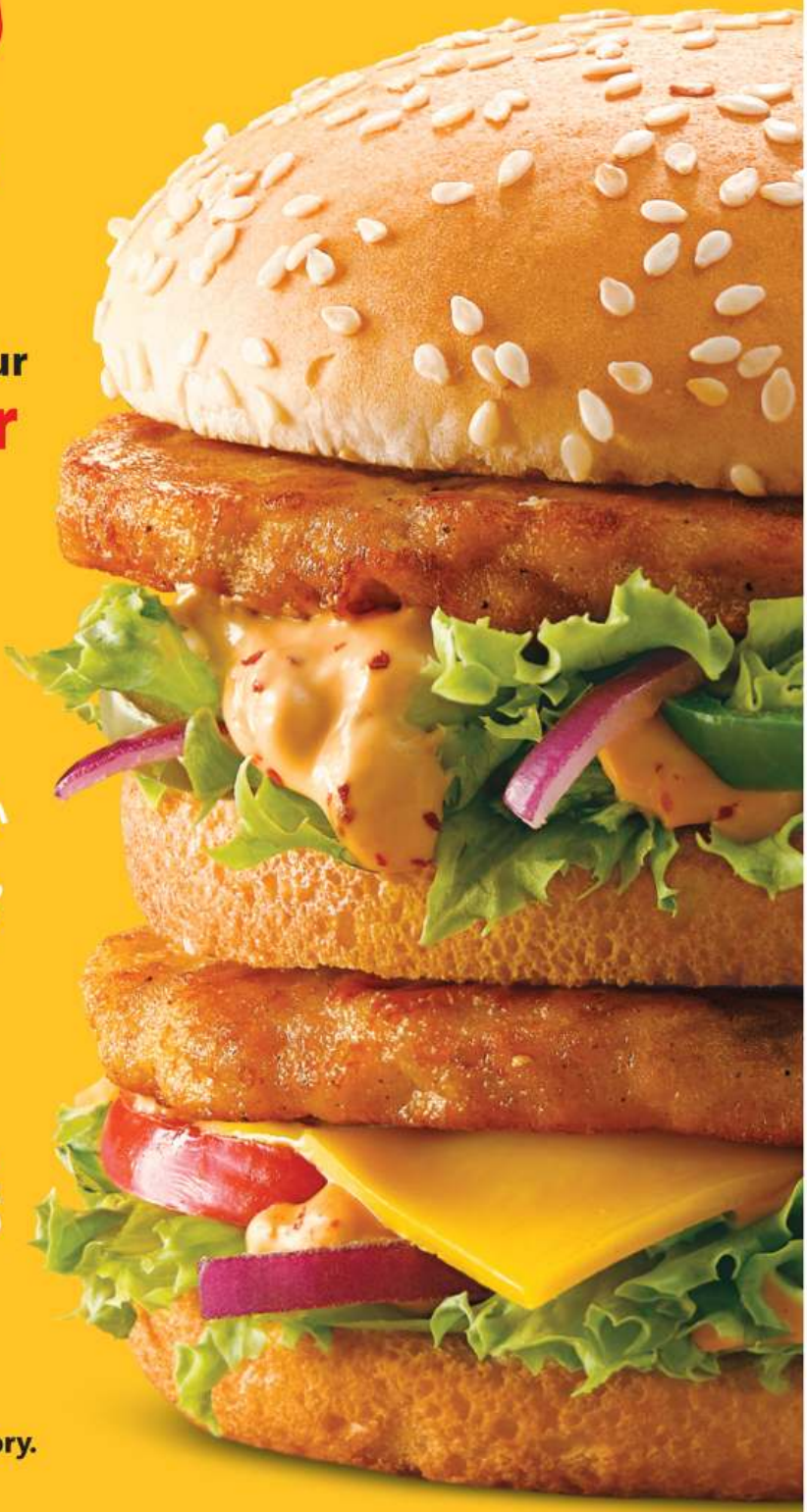

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The above image showcases the Chicken Maharaja Mac. The Maharaja Mac is available in Veg and Non-veg. Terms and conditions apply. For details, refer to our website www.mcdonaldsindia.com. © 2019 McDonald's. IMAGES ARE REPRESENTATIONAL.

dairy products. For an average adult, one cup of raw spinach provides 145 micrograms (mcg) of vitamin K1, or 181 percent of the Daily Value; one cup of raw kale provides 113 mcg, or 141 percent; and half of a cup of chopped boiled broccoli provides 110 mcg, or 138 percent.

Food neophobia may increase the risk of lifestyle diseases

Science Daily
June 18, 2019

Food neophobia, or fear of new foods, may lead to poorer dietary quality, increase the risk factors associated with chronic diseases, and thus increase the risk of developing lifestyle diseases, including cardiovascular diseases and type 2 diabetes.


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These are some of the findings of a study conducted by the Finnish National Institute for Health and Welfare, the University of Helsinki, and the University of Tartu in Estonia.

Food neophobia is an eating behaviour trait in which a person refuses to taste and eat food items or foods they are not familiar with. The study examined the independent impact of eating behaviour, and especially food neophobia, on dietary quality as well as lifestyle diseases and their risk factors. So far, little research has been carried out on this area.

The study monitored individuals aged between 25 and 74 years in the Finnish FINRISK and DILGOM cohorts and an Estonian biobank cohort during a seven-year follow-up.

Food neophobia is hereditary

Food neophobia has been observed to be a strongly hereditary trait: twin studies have found that up to 78% of it may be hereditary. The trait can be easily measured using the FNS questionnaire (Food Neophobia Scale), which contains ten questions charting the respondent's eating behaviour. The FNS questionnaire was also used to measure and quantify the fear of new foods in this study.

Food neophobia is common in children and older persons, in particular. Few studies have so far been carried out on food neophobia in the adult population.

Traits similar to food neophobia, including picky and fussy eating, also occur in different age groups in the population. These eating behaviours may also have a significant impact on dietary quality and subsequently health. As different traits associated with eating behaviours have overlapping characteristics making a clear-cut distinction between them is challenging.

Food neophobia has independent health impacts

The study found that food neophobia is linked to poorer dietary quality: for example, the intake of fibre, protein and monounsaturated fatty acids may be lower and the intake of saturated fat and salt greater in food neophobic individuals.

Additionally, a significant association was found between food neophobia and adverse fatty acid profile and increased level of inflammatory markers in blood. Subsequently, food neophobia also increases the risk of developing cardiovascular diseases or type 2 diabetes.

It is often thought that the impacts of eating behaviour and diet on health are mainly mediated through weight changes alone. In this study, however, the impacts of food neophobia emerged independently regardless of weight, age, socioeconomic status, gender or living area.

Your parents were right: you should always try all foods!

"The findings reinforce the idea that a versatile and healthy diet plays a key role, and even has an independent role in health. If we can intervene in deviant eating behaviours, such as food neophobia, already in childhood or youth. This will help to prevent potential future health problems early on," says Research Professor Markus Perola from the National Institute for Health and Welfare.

"Hereditary factors and our genotype only determine our predisposition to food neophobia. Early childhood education and care and lifestyle guidance in adulthood can provide support in the development of a diverse diet."

Fatty fish without environmental pollutants protect against type 2 diabetes

Science Daily June 19, 2019

If the fatty fish we eat were free of environmental pollutants, it would reduce our risk of developing type 2 diabetes.


Image © iStock.com/gldburger

However, the pollutants in the fish have the opposite effect and appear to eliminate the protective effect from fatty fish intake. This has been shown by researchers at Chalmers University of Technology in Sweden, using innovative methods that could be used to address several questions about food and health in future studies.

Research on the effect of fish consumption on diabetes risk has produced contradictory results in recent years. Some studies show that eating a lot of fish reduces the risk of developing type 2 diabetes, while others show it has no effect, and some studies show it even tends to increase the risk. Researchers at Chalmers University of Technology conducted a study with an entirely new design and have now arrived at a possible explanation for this puzzle.

"We managed to separate the effect of the fish per se on diabetes risk from the effect of various environmental pollutants that are present in fish," says Lin Shi, a Postdoc in Food and Nutrition science. "Our study showed that fish consumption as a whole has no effect on diabetes risk. We then screened out the effect of environmental pollutants using a new data analysis method based on machine learning. We were then able to see that fish themselves provide clear protection against type 2 diabetes."

"Protection is provided primarily by consumption of fatty fish. However, at the same time, we saw a link between high consumption of fatty fish and high contents of environmental pollutants in the blood."

Environmental pollutants measured in the present study are persistent organic pollutants (POPs), for example dioxins, DDT and PCB. Previous research has shown that they may be linked to increased risk of type 2 diabetes. The varying effect of fish on diabetes risk in different studies could therefore be due to varying levels of consumption of fish from polluted areas in the different studies.

According to the Swedish National Food Agency, food is the main source of exposure to dioxins and PCBs. These substances are fat soluble and are primarily found in fatty animal foods such as fish, meat and dairy products. Particularly high contents are found in fatty fish such as herring and wild salmon from polluted areas. In Sweden, for example, this means the Baltic Sea, the Gulf of Bothnia and the biggest lakes, Vänern and Vättern.

The Chalmers researchers also used a new method to find out what the study participants had eaten, as a complement to questionnaires on dietary habits. Previous research has often relied entirely on questionnaires. This produces sources of error that may also have contributed to the contradictory results concerning fish and type 2 diabetes.

"Using a technique known as mass spectrometry based metabolomics, we identified around 30 biomarkers in blood samples, i.e. specific molecules that could be used to objectively measure of how much fish the study participants had consumed," says Lin Shi.

Overall, the new methodology provides considerably better tools for this research field. They can be used to better discern which dietary factors are the actual causes of different types of health effects.

"Metabolomics and the new way of analysing data give us new opportunities to distinguish between effects from different exposures that are correlated," says RikardLandberg, Professor of Food and Nutrition Science at Chalmers. "This is very important as otherwise it is difficult to determine whether it is diet, environmental pollutants or both that affect the risks of disease."

More about the study:
The study is a case-control study nested in a prospective cohort in Västerbotten in northern Sweden. The participants had completed questionnaires on dietary habits and lifestyle, and provided blood samples, which were frozen. A total of 421 people who had developed type 2 diabetes after an average of 7 years were included, and they were compared with 421 healthy control individuals. The original blood samples were then analysed. In addition, blood samples were analysed that had been provided ten years after the first blood samples by 149 of the case-control pairs.

Establishing MFGM efficacy: NZMP scientist highlights its potential for infant brain health

"Saying that MFGM is in breast milk is not a justification to put it in formula. You have to show why you need it there."
28 Jun 2019 Nutrition Insight

Currently, standard infant formula lacks milk fat globule membrane (MFGM), which is essential to providing a composition similar to breast milk – the gold standard of nutrition for infants.

At this month's ESPGHAN Congress 2019, NZMP's Senior Research Scientist James Dekker presented its new abstract which focuses on MFGM composition in human milks and bovine milk ingredients,

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and MFGM proteins in infant formula. He speaks to NutritionInsight on how the business has set its sights on establishing MFGM's efficacy for infant nutrition, particularly in relation to cognitive development and function.

Health and well-being are, of course, optimal to all age groups, but it is arguably most vital to vulnerable groups such as babies and toddlers. The market of formula products that not only aim to fill babies' bellies but add extra health benefits is growing and in demand. According to Innova Market Insights data, infant nutrition launches continue to grow, noting a 13 percent average annual growth between 2014 and 2018. This increase in launches is reportedly driven by rising demand, attributed to a growing number of women entering the workforce, as well as calls for clean labels that are also allergy-free or pack an extra health punch.

Cognition, and within this brain health, has become an increasingly prominent health concern among consumers of all ages – and the industry has taken notice. Innova Market Insights reports that brain health claims are on the rise, with more than twice as many products (excluding infant nutrition) featuring a brain health claim in 2017, than in 2013. Emerging science is highlighting the importance of the gut-brain axis, which underscores a symbiotic link between the body's microbiota and overall mental wellbeing.

NZMP, Fonterra's brand of dairy ingredients and solutions, has two main Lipid ingredients; MFGM Lipid 100 and MFGM Lipid 70. The MFGM is a trilayer of phospholipids, glycolipids, cholesterol and membrane proteins surrounding the triglyceride droplets in all mammalian milks. Traditionally MFGM was isolated by churning chilled cream into butter; the resulting aqueous phase, named buttermilk, contains broken MFGM fragments, explains the company in a white-paper entitled, "SureStart MFGM Lipid: Milk Fat Globule Membrane ingredients and brain developments," published in 2019.

Dekker explains that NZMP's approach to MFGM is twofold. "First, we want to make formula closer to breast milk by providing it with something that it hasn't had, so far. Second, we want to demonstrate why it should be there. It should become a standard ingredient, but we have to catch up on the science side. Saying that it is in breast milk is not enough of a justification to put it in formula. You have to show why you need it there."

In this vein, last year, the company received some preliminary results around a Chinese study which found that infants consuming MFGM infant formula showed cognitive improvements and development. In particular, the supplementation of MFGM in healthy infants in the first 12 months of life showed statistically significant improvements in cognitive development and improved general adaptive behavior scores based on the development of a combination of functions such as social and motor skills, self-direction, communication and self-care. Such studies are paramount in the path to MFGM becoming a standard ingredient.

"We are now embarking on a second study to confirm this [the findings from the Chinese study]. We need two clinical trials showing the same thing to take it to regulatory authorities to say it should be in formula. We have safety and now we are building the efficacy to justify its use in formula," he says.

Dekker explains that the company's end goal is for the ingredient becoming intrinsically biologically relevant, in the sense that it could be referred to as an ingredient that has cognitive benefits – but regulatory approval is needed for this step, as well as solid scientific backing.

A positive side note flagged by Dekker is that awareness of MFGM is increasing. "One aspect [of rising awareness] is that MFGM is a component that will allow infant formula to move toward breast milk. Also, when we say 'cognitive element,' it does not just denote intelligence. It's not just making a 'smarter baby,' it can go further as it can help with social engagement and the whole development of the person," he explains.

"This does resonate with parents as they want to see their child grow emotionally and socially as well as intellectually."

Tapping into the gut-brain axis

Of course, the fact that the ingredient proves cognitive development is a link between the gut and brain. However, Dekker elaborates on this, noting that, "We know it's not as straightforward as the ingredient appearing in the brain. It appears to be something more complicated going on."

NZMP is part of the Smarter Lives initiatives, a five-year research program that investigates how nutrition impacts the gut-brain axis. Smarter Lives is funded by New Zealand's Ministry of Business, Innovation and Employment and led by New Zealand research institute, AgResearch.

Regarding brain development, products that utilize the gut-brain axis are tapping into a vast network of neurons – the enteric nervous system – that line the gut. Research suggests that a direct line of two way communication exists between the brain and the enteric nervous system. This may mean that influences on the gut and its functions, such as diet, could impact signals sent to the brain.

"We know the first years of a child's life are a sensitive period during which the child's brain is most receptive to the effects of nutrition and its environment. Both are vital for the optimal development of the brain," Dekker says.


Image © iStock.com/NexTser

"The Smarter Lives research program will build on existing research and unlock how we can influence the two-way communication between the gut and the brain to help to optimize cognitive development in formula-fed infants."

Looking forward, the NZMP team is also investigating spaces beyond cognition and the brain. Immune health is a space that holds potential and warrants further research, as well as further understanding the technicalities around what it is about MFGM that makes it so effective as a structure providing nutrition to the infant.

"MFGM hadn't really been studied until about a decade ago. So it's really exciting having been involved in such cutting-edge science and bringing that to consumers," concludes Dekker.
By LaxmiHaigh


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Fabulous fiber? Beta-glucan research highlights potential for immune health

Dietary fibers may even help cancer patients' immune cells recover more quickly

27 Jun 2019 Nutrition Insight

Dietary fibers are enjoying a place in the health spotlight thanks to the growing body of scientific evidence supporting their contribution to a lowered risk of non-communicable diseases.

Notably, these fibers have been tipped as key to improving immunity. NutritionInsight spoke with Dr. CoenGovers from Wageningen Food &Biobased Research about his ongoing work to uncover how dietary fibers may benefit cancer patients' during their recovery process.

"Dietary fibers in themselves are already being applied to lower cholesterol and can be used to modify the glycemic response, making them candidate supplements in relation to diabetes. In fact, fibers can improve digestion and overall quality of life," explains Govers.

"We have started reading on claims that dietary fibers could be beneficial for patients being treated for cancer," Govers explains. "In China and Japan, there is a long-lasting tradition and affinity for fibers based on their potency and benefits towards health and well-being. In this region, researchers have also performed studies with cancer patients, but mainly when patients were treated with chemotherapy rather than immunotherapy. Researchers found that dietary fibers reduced the impact of the side effects of chemotherapy."

According to this prior research, notes Govers, when undergoing chemotherapy, dietary fibers may help the recovery of the patients' immune cells more quickly – chemotherapy generally kills rapidly dividing cells, such as tumor cells but also (as a side effect) immune cells, and fibers may help in enabling immune cells to recover.

Many other studies demonstrated that fibers interact with innate type immune cells which are critical in orchestrating a full T cell-mediated anti-tumor response.

"Based on this rationale we set out to further investigate the exact immunomodulatory potency of the dietary fibers, with the financial support of the Dutch Cancer Society, in particular in relation to therapies that rely on immune cells, i.e., adoptive T cell therapies. Adoptive T cell therapy is a form of therapy in which patients receive an infusion of their own immune cells (in fact T lymphocytes) that are trained to recognize tumor cells," he explains.

"Associate Professor Reno Debets, who leads the Tumor Immunology laboratory at the Department of Medical Oncology at Erasmus MC – a Cancer Institute in Rotterdam – develops and tests adoptive T cell therapies. I was trained as a Ph.D.

student into T cell immunology in his laboratory and now we are both collaborating on a project to see how dietary fibers may boost adoptive T cell therapies. For this project, we perform tests with human immune cells, but also rely on a preclinical mouse model that strongly mimics the human situation in which skin tumors are combated with adoptively transferred T cells, but do show, in a fair fraction of mice, therapy resistance. Together we decided to look into beta-glucans, a potent sub-group of dietary fibers, and how these fibers affect immune cells and may improve adoptive T cell therapy," Govers says.

One aspect of their research is that there is an endless supply of dietary fibers – whether that be directly from the plant kingdom or, after synthesis and processing, thereby modifying their bioavailability. They, therefore, investigated a number of different beta-glucans to see how structure or source might impact health effects.

"One of the issues is that you need to describe very clearly which type of dietary fiber you use and what type of processing they have undergone, so others can copy exactly what you did in your research," Govers explains.

The role for beta-glucan

One ingredient currently taking a leading role in meeting demands in the immunity space is yeast beta-glucan. Derived from common baker's yeast, yeast beta-glucan has been found to maintain or stimulate the effectiveness of the immune system.

The team began with a general investigation on beta-glucans. "We have in vitro tested dietary fibers on a specific innate type immune cell type, the macrophage, which has a key regulatory role in the intestine, and provides a link to T cell responses as described earlier," Govers notes.

Since everything we eat comes in contact with the intestine before it interacts with the rest of the immune system, Govers puts forward that by exploring how these macrophages respond to the dietary fibers, we could start identifying the first steps towards their effects on immune cells and in particular their downstream effects on anti-cancer T cell responses.

"We started to screen nine different beta-glucans – including yeast beta-glucan – for their immunomodulatory potency and saw that beta-glucans, but also other types of dietary fibers, strongly push macrophages with an inhibitory phenotype – often seen in tumors – into a phenotype that is more favorable in combating tumors. One striking observation is the increased expression of chemokines – a set of proteins that attract immune cells towards tissues, in this case, cancers," he notes. In fact, the limited expression of these molecules in therapy-resistant tumors (as observed by the Erasmus MC team) makes this effect of beta-glucans of exceptional therapeutic relevance.

The team is currently continuing its research by performing animal trials at the Erasmus MC in which they are testing the beta-glucans alongside the adoptive T cells therapy, with results still forthcoming.

Industry takes note

Fiber is set to be a huge trend in 2019, with consumers' knowledge around its benefits increasing and manufacturers engaging in fibrous NPD. Innova Market Insights has tipped "A Fresh Look at Fiber" to be a key trend this year.

According to an Innova Market Insights' consumer survey (2018), 44 percent of US consumers are increasing their consumption of fiber and 33 percent of UK consumers following this trend. At the same time, 21 percent of average annual growth has been reported in new product launches carrying a fiber claim.

In general, immune health product launches are increasing, and Innova Market Insights noted that food and beverage initiatives featuring an immune health claim increased with a CAGR of 18 percent in Europe between 2013 and 2017.

Research such as that of Govers and Debets further highlights the vast potential of this ingredient group.
By Lucy Gunn

Study unveils gut health and obesity link, suggests novel approaches to weight management

Fat-loss causes the intestine to grow and increases its capacity to absorb nutrients, according to the study

26 Jun 2019 Nutrition Insight

Loss of body fat causes the growth of the intestine and increases its capacity to absorb nutrients, which may present an opportunity for a new approach to weight management.

This is according to research from Teagasc, the semi-state authority in the Republic of Ireland responsible


Image © iStock.com/FredFroese

for R&D services in the agri-food sector and researchers from the University of Aberdeen, Scotland. The researchers found that the depletion of fat stores inside the body causes the growth of the intestine via a signaling mechanism involving the brain (fat-brain-intestine signaling). The researchers note that the findings may lead to novel weight loss intervention methods.

"This effect is not limited to calorie restriction as our findings suggest that other interventions (specifically bariatric surgery, lactation, cold exposure and dietary whey protein intake), all of which decrease body fat, cause the above change in the intestine," KanishkaNilaweera, Research Officer for Food Biosciences Research Department at Teagasc Food Research Centre, tells NutritionInsight. "While most nutritional interventions, such as calorie restriction, cause the loss of body fat, the weight is generally regained when one stops these interventions. This is generally the case post-weight loss because most people find it hard to continue with weight loss interventions long term," he adds.

Obesity has become a global epidemic, affecting over 600 million adults worldwide and is linked to the over-consumption of high-energy palatable foods. While dieting is a popular way to lose body fat, it may cause the intestine to grow. The resulting increased nutrient absorptive capacity of the intestine may, in turn, cause quicker weight gain post dieting, the researchers say.

Centre"This work will pave the way for more sustainable weight loss interventions", explains Nilaweera. "Along with the obesity epidemic, there is an under-nutrition epidemic which affects over 462 million people worldwide. This is due to either physical inability to consume food (due to old age or chronic illness) or psychological reasons (anorexia)." "For the affected individuals, strategies have to be developed to better absorb the nutrients that they are currently getting. This can potentially be done by targeting fat-brain-intestinal signaling components sensitive to nutrients with the objective of stimulating the growth of the intestine," he adds.

In the study, the researchers looked into the use of whey proteins to address this problem as these proteins cause the gut to shrink.

"Our research shows that whey protein intake can suppress the growth of the intestine. We focused on these proteins because they are part of our diet since birth (in milk), but here we have isolated these milk proteins and enriched them in a diet. By feeding it to mice, we showed that the whey proteins suppress the growth of the intestine," Nilaweera says.

According to Nilaweera, following the cessation of the weight loss-intervention, one must be careful of the diet one chooses, because the extra calories ingested can quickly lead to a substantial weight regain due to the above-mentioned change in the intestine. Therefore, maintaining a low-calorie diet post-weight loss intervention would help to minimize weight regain.

Going forward, the researchers are planning more research to discover how dietary whey proteins cause the gut to shrink.

"We believe that digestion of these proteins in the gut produces some mixture of peptides and/or amino acids, which then affects the intestine. Ultimately, we want to find these active components in whey proteins and include these in human diets, so that these active components can produce the same effect on the intestine (and hence body fat) within a few meals as compared to daily consuming whey proteins," Nilaweera concludes.
By KristianaLalou

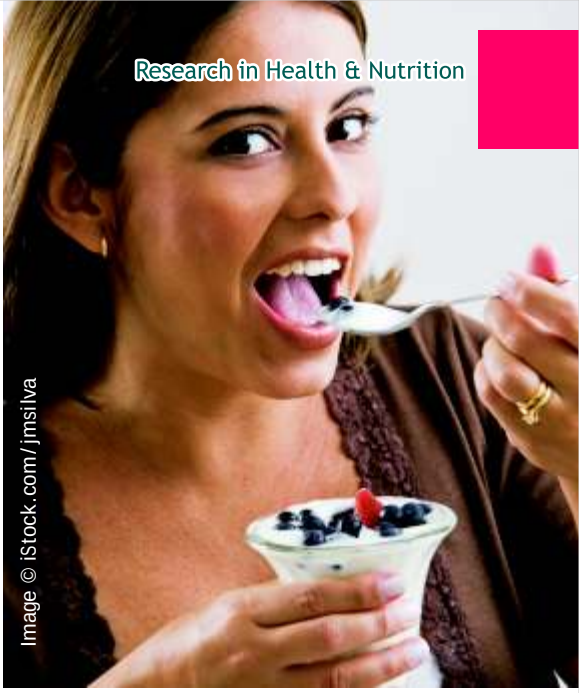


Image © iStock.com/jmsilva

Pregnancy probiotics: Probi's concept can prevent anemia in mothers-to-be, study finds

19 Jun 2019 Nutrition Insight

A probiotic concept containing Lactobacillus plantarum 299v and a mix of vitamin C, folic acid and iron, ProbiFerroSorb, has been found to improve the iron status of pregnant women significantly.

Iron deficiency is the most common nutrient deficiency in the world and is especially common during pregnancy. However, Probi, who developed the concept, notes that common iron supplements can cause unpleasant side effects such as abdominal pain and constipation. These findings support the further development of probiotic concepts targeting pregnancy, which may reduce iron deficiency levels without unpalatable side effects.

Based on the ProbiFerroSorb concept, the company is now also introducing Probi Gravid on the Swedish market as a supplement. It is also under introduction to customers worldwide, expecting to see new product launches moving forward.

"The study findings present an opportunity to safely improve health

in pregnant women, a particularly sensitive population, through the use of Probi's probiotics," says TittiNiskanen, Director of R&D and Clinical Operations at Probi. "The results show that use of ProbiFerroSorb reduced iron deficiency as well as the prevalence of anemia for the study participants. This is the first double-blind, placebo-controlled study in pregnant women evaluating the effect on iron status of probiotics and is an important milestone for Probi in proving the health benefits of our probiotics also for expecting mothers."

Probi's probiotics have been found to support the health of other populations, such as bone health in seniorsand delaying the onset of gluten intolerance in children.

Importance of tackling Iron deficiency

Iron deficiency is especially common during pregnancy and can lead to anemia, which can cause multiple symptoms, such as fatigue, weakness, pallor, tachycardia, and shortness of breath. It also confers negative outcomes for the baby, such as low birth weight, premature birth, and increased mortality.

Iron supplementation is currently the standard treatment for iron deficiency. However, only a small part of the supplemented iron is absorbed, and users can experience side-effects.

ProbiFerroSorb has earlier been proven to increase iron absorption in healthy women of childbearing age, notes the company. This new trial included 326 healthy, pregnant women. The results provide evidence that iron status is significantly improved for pregnant women after intake of ProbiFerroSorb, which was administered twice daily from early pregnancy and until delivery.


Image © iStock.com/AntonioGuillem

The effect was measured on iron status and the treatment with the probiotic product showed significant improvement compared to placebo. The treatment resulted in reduced iron deficiency, and also significantly reduced the prevalence of anemia and iron deficiency anemia during the last trimester of pregnancy.

The findings show that the increased iron absorption results in not only improved iron stores but also prevents iron deficiency anemia in this sensitive population of mothers-to-be – a group of consumers in high need of additional iron, Niskanen tells NutritionInsight.

"ProbiFerroSorb is a unique probiotic concept for people with low iron levels, increasing the uptake of iron and potentially helping to normalize the iron levels for the person taking the supplement. Probi has now shown that this probiotic concept is safe for use by and provides health benefits to the important population of mothers to be all over the world – a group of consumers in high need of additional iron," says Tom Rönnlund, CEO of Probi.

Meanwhile, in 2018, Probi signed a long-term agreement with Cilag, a member of the Johnson & Johnson Family of Companies, for the development of a probiotic product. The long-term deal with Cilag will aim to further expand Probi's product development pipeline and commercialize its strain portfolio. The parties will jointly initiate a probiotic development program. The program will be funded under non-disclosed financial terms by Cilag GmbH International and Probi will contribute with probiotic expertise.
By LaxmiHaigh


Image © iStock.com/Bet_Noire

Online shopping interventions may encourage customers to buy healthier foods

17 Jun 2019 Nutrition Insight

Altering the default order in which foods are shown on the screen, or offering substitutes lower in saturated fat could help customers make healthier choices when shopping for food online, according to a study published in the open access International Journal of Behavioral Nutrition and Physical Activity.

This is reportedly the first randomized trial to directly compare interventions targeting the environment and the individual to encourage healthier food choices. According to the researchers the findings could provide effective strategies to improve the nutritional quality of online food purchases.

"Finding effective ways of lowering the saturated fat in our shopping baskets, such as from meat, cheese, or desserts, may translate to eating less of it, which could help lower our risk for heart disease," says Dr. Dimitrios Koutoukidis, the lead author.

Dr. Koutoukidis and a team of researchers at the University of Oxford, UK, conducted an experiment with 1088 grocery shoppers from UK households, using an experimental online supermarket specifically designed for the study.

Participants were asked to select ten "everyday" foods that they and their household would want to eat, from a pre-specified shopping list.

Participants were randomly allocated to one of four groups. The first group was shown a list of food products ranked according to their saturated fat content from low to high (environmental-level intervention).

The second group was offered the option to swap a product high in saturated fat for a similar one with lower saturated fat (individual-level intervention). The third group was shown a combination of both the ranked list and offered the option to swap products (combined intervention), while the fourth group was shown neither a ranked list, nor given the option to swap products (no intervention control).

The authors found that participants in any of the intervention groups chose products with less saturated fat than those who received no intervention. Altering the default order was more effective than offering product swaps. Combining the two was more effective than offering swaps but no more effective than altering the default order of items.

For participants who received no intervention, the percentage of calories from saturated fat in their shopping baskets was 25.7 percent. Altering the order of foods or offering swaps reduced the percentage calories from saturated fat by 5.0 percent and 2.0 percent, respectively. A combination of both interventions reduced it by 5.4 percent compared to controls. The total cost of the shopping basket did not differ significantly between groups.

The authors caution that these interventions need to be tested now in real online supermarkets, as this was an experimental platform where participants chose but did not receive the food and did not spend their own money. As the pre-specified shopping list focused on foods high in saturated fat, the effect of these interventions would likely be smaller during real-life shopping which would include a broader range of products.

"These results could be capitalized by online supermarkets which could implement either or both strategies knowing that they are potentially effective for lowering the saturated fat in their customers' shopping baskets and thus shape healthier food choices," says Dr. Koutoukidis.


Image © iStock.com/ JohnnyGreig

Don't judge a food by its label: Individual gut responses to foods found to vary

The impact of leafy greens on the gut, for example, can be vastly different to how carrots may influence it, despite their nutritional profiles being similar.

13 Jun 2019 Nutrition Insight

Foods that look the same on nutrition labels can have vastly different effects on our microbiomes, a recent study has found, further expanding knowledge on the intricate relationship between gut bacteria and overall health.

The impact of leafy greens on the gut, for example, can be vastly different from the influence of carrots, despite their nutritional profiles being similar. The researchers have now developed a new approach for measuring and comparing the different foods – based on the gut.

"Nutrition labels are human-centric," says senior author Dan Knights of the Department of Computer Science and Engineering and the BioTechnology Institute at the University of Minnesota. "They don't provide much information about how the microbiome is going to change from day to day or person to person."

In the study, the investigators enrolled 34 participants to record everything they ate for 17 days. Stool samples were collected daily and shotgun metagenomic sequencing was performed. This allowed the researchers to see at a very high resolution how different people's microbiomes, as well as the enzymes and metabolic functions that they influence, were changing from day to day in response to what they ate. The study provided a resource for analyzing the relationships between dietary changes and how the microbiome changes over time.

A new nutritional system?

"We expected that by doing this dense sampling – where you could see what people were eating every single day and what's happening to their microbiome – we would be able to correlate dietary nutrients with specific strains of microbes, as well as account for the differences in microbiomes between people," Knights says. "But what we found were not the strong associations we expected. We had to scratch our heads and come up with a new approach for measuring and comparing the different foods."

What the researchers observed was a much closer correspondence between changes in the diet and the microbiome when they considered how closely foods were related to each other rather than simply comparing their nutritional content. Following this, the researchers developed a tree structure to convey the statistical information of closely related foods.

Two people in the study consumed nothing but Soylent, a meal replacement drink that is popular with people who work in technology. Although it was a very small sample, data from these participants showed variation in the microbiome from day to day, suggesting that a monotonous diet does not necessarily lead to a stable microbiome.

"The microbiome has been linked to a broad range of human conditions, including metabolic disorders, autoimmune diseases and infections, so there is strong motivation to manipulate the microbiome with diet as a way to influence health," Knights concludes. "This study suggests that it's more complicated than just looking at dietary components like fiber and sugar. Much more research is needed before we can understand how the full range of nutrients in food affects how the microbiome responds to what we eat."

The microbiome: A complicated picture for health?

Digestive health is an ongoing discussion and science continues to link a healthy microbiome to nearly every facet of health. For example, research has pointed to a relationship between the gut and the gastrointestinal tract and the central nervous system, known as the "gut-brain axis." There is also mounting evidence linking imbalances in the microbial species that make up the gut microbiome to a number of health problems including allergies, autoimmune disorders and psychiatric mood disorders. Probiotics have even been flagged as a potential avenue of treatment to alleviate bipolar and other psychiatric mood disorders, such as depression.

A wealth of investments have also been donated to the space to accelerate understanding and innovation. In March, European venture capital firm Seventure Partners completed the first closing of its second dedicated fund focused on the microbiome and health, nutrition and digital/connected health sectors with a target for the final close of over €200 million.

Also earlier this year, The Master Project, which aims to harness microbiome knowledge and DNA sequencing to boost food chain sustainability, received EU funding of nearly €11 million.

The continuous media reporting on gut health has also helped stimulate consumer interest in probiotics. The gut health platform offers a wealth of opportunities to formulators, but due to regulatory demands, research data gaps and increasing consumer scrutiny, a clear view of how to navigate this space is vital.

"Extremely dangerous": Certain dietary supplements putting young adults at risk, US study warns

"Concerning" findings on weight loss, energy and muscle building supplements may just be the tip of the iceberg, warn US researchers

07 Jun 2019
Nutrition Insight

Severe medical events as a result of dietary supplement use – sold for weight loss, sexual function, muscle building and energy – are experienced by young people at a threefold higher rate than vitamin use.

This is according to new Harvard T.H. Chan School of Public Health research, which cites the findings as "very concerning." Although the study did not identify particular "risky" ingredients in the supplements, previous research has found that undeclared prescription pharmaceuticals, steroids, kava and germander are likely culprits, as they can lead to liver damage and other concerning health consequences. The team asserts that proactive enforcement of regulations is needed to reduce access and consumption among adolescents and young adults – the key demographic attracted to these kinds of supplements.

"The Food and Drug Administration (FDA) has issued countless warnings about supplements sold for weight loss, muscle building or sport performance, sexual function and energy, and we know these products are widely marketed to and used by young people. So what are the consequences for their health? That's the question we wanted to answer," says lead author Flora Or, Researcher with Harvard Chan School's Strategic Training Initiative for the Prevention of Eating Disorders.

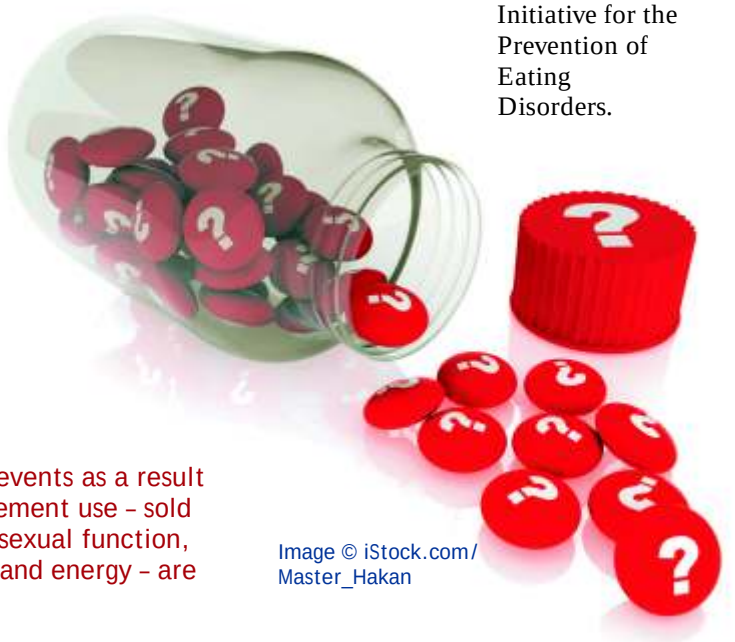


Image © iStock.com/ Master_Hakan

"These supplements are adulterated with toxic ingredients, based on prior research. We are only describing the tip of an iceberg because there is huge under-reporting both on the consumer and on the physician side [on adverse health impacts]," she tells NutritionInsight.

The findings follow a recent FDA move to significantly "modernize" dietary supplement regulations and root out "bad actors" that distribute and sell dangerous products. It released a new Dietary Supplement Ingredient Advisory List containing warnings about unlawful ingredients in dietary supplements.

While many dietary supplements do meet the FDA's standards, there are some companies who knowingly distribute and sell dangerous or otherwise illegal products that put consumers at risk, according to the regulatory agency.

This new Harvard study enforces concern over the efficacy and safety of some supplements, especially when they are targeted at vulnerable populations such as young people.

The supplements can be adulterated with toxic ingredients and are often marketed to young adults.
The researchers looked at adverse medical events that were reported between January 2004 and April 2015 in the FDA Adverse Event Reporting System on the food and dietary supplements database. They analyzed the relative risk for severe medical events such as death, disability and hospitalization in individuals aged 25 years and under that were linked with the use of dietary supplements sold for weight loss, muscle building, or energy – compared to vitamins.

They found that there were 977 single-supplement-related adverse event reports for the target age group. Of those, approximately 4 percent involved severe medical outcomes, including death and hospitalization.

Why are these supplements still on the market?

Despite FDA warnings on such supplements, many are still available for purchase.
This is due to two main reasons, Or tells NutritionInsight. "First, dietary supplement manufacturers do not have to get the agency's approval before producing or selling these products," she notes.

"Second, the Dietary Supplement Health and Education Act prohibits the FDA from prescreening supplements for safety or efficacy and instead forces the agency to rely on an honor system in which manufacturers are expected by the government to ensure the safety of their products before launching them on the market."

A further problem arises as, following consumer supplement use, it can be difficult to track the rates of dangerous outcomes as consumer and physician reporting tends to be low.

"Consumers are unlikely to link the symptoms to the supplements they consumed and report them unless the symptoms are very severe. There is also prior research suggesting that physicians under-report adverse events associated with dietary supplements," she adds.

Moving forward, more research is needed to evaluate the effectiveness of different policy strategies to protect young people from dangerous dietary supplements.

Earlier this week, the FDA issued a warning to consumers about concerns regarding the safety of vinpocetine, an ingredient often marketed for cognitive sharpness. Specifically, the agency is voicing concerns about the use of this ingredient by women of childbearing age, following reports stating that vinpocetine may cause a miscarriage or harm fetal development.

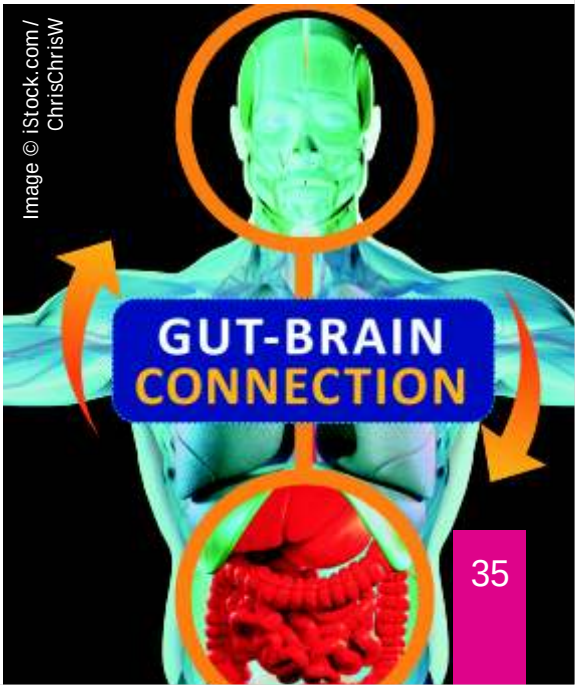
In a similar vein, the FDA is seeking to provide "legal pathways" to the growing market of supplements and food and beverage products infused with cannabidiol (CBD). On May 31, the agency held a public hearing on products containing cannabis or cannabis-derived compounds, signaling its commitment to adequately respond to this growing industry opportunity and ensure consumer safety. More than 500 people attended the hearing and over 800 people registered to join the event remotely, while 100 speakers presented on the topic. "We encourage all stakeholders – presenters, attendees, and those unable to participate in today's hearing – to submit comments to our docket on this topic, which is open until July 2, 2019," noted Norman E. Sharpless, MD, USFDA Acting Commissioner of Food and Drugs.
By LaxmiHaigh

Gut-brain link to autism confirmed: Study identifies similar gene mutation in both the brain and gut

The finding may reveal novel treatments for autism-related behavioral issues by targeting the gut

05 Jun 2019 Nutrition Insight

Autism is linked to similar gene mutations found in both the brain and the gut, according to a new



study from the Royal Melbourne Institute of Technology (RMIT) in Australia.

The vast majority of people with autism suffer from gut problems and the reason behind this was, until now, unknown. The study findings confirm a gut-brain nervous system link in autism, opening a new direction in the search for potential treatments that could ease behavioral issues associated with autism by targeting the gut.

Scientists trying to understand autism have long been looking into the brain, but the links with the gut nervous system have only been recently explored, says RMIT Chief Investigator, Associate Professor Elisa Hill-Yardin. "We know the brain and gut share many of the same neurons and now for the first time we've confirmed that they also share autism-related gene mutations."

"Up to 90 percent of people with autism suffer from gut issues, which can have a significant impact on daily life for them and their families," she notes. "Our findings suggest these gastrointestinal problems may stem from the same mutations in genes that are responsible for brain and behavioral issues in autism."

Hill-Yardin goes on to say that the findings, which are to be published in Autism Research, offer a whole new way of thinking about the matter for clinicians, families and researchers. In addition, they broaden the scientific community's horizons in the search for treatments to improve the quality of life for people with autism.

Gene mutation related to autism also linked to gut dysfunction

The study identified a gene mutation that affects neuron communication in the brain, which was the first to be identified as a cause of autism. The same gene is also responsible for dysfunction in the gut. The research combined new results from pre-clinical animal studies with previously unpublished clinical work from a landmark 2003 study led by Swedish researchers and a French geneticist.

Professor Christopher Gillberg (University of Gothenburg), Professor Maria Råstam (Lund University) and Professor Thomas Bourgeron (Pasteur Institute) followed two brothers with autism and were the first to identify the specific gene mutation as a cause of the neurodevelopmental disorder.

This mutation affects communication by altering the connection ("velcro") between neurons that keeps them in close contact. While the 2003 study primarily focused on identifying the genetic basis for autism, Gillberg and Råstam took detailed clinical notes of the brothers' significant gastrointestinal problems.

The RMIT researchers built on this clinical work with a series of studies on the function and structure of the gut in mice that have the same "velcro" gene mutation.

The team found this mutation affects:

- Gut contractions.
- The number of neurons in the small intestine.
- The speed that food moves through the small intestine.
- Responses to a critical neurotransmitter important in autism (well known in the brain but not previously identified to play any major role in the gut).

Collaborator Associate Professor Ashley Franks from La Trobe University, Melbourne, Australia, also found significant differences in the gut microbes of mice with the mutation and those without it, even though both groups were kept in identical environments.

"While this specific 'velcro' mutation is rare, it is one of more than 150 autism-related gene mutations that alter neuronal connections," Hill-Yardin says. "The link we've confirmed suggests a broader mechanism, indicating that the mutations that affect connections between neurons could be behind the gut problems in many patients."

New research avenues

Hill-Yardin says the work identifies a new a target for the development of therapies specifically designed to work on neurotransmitters in the gut. "We've also identified that there's a need to better understand how existing autism medications that target neurotransmitters in the brain are affecting the gut," she notes.

"Another promising path for future research is investigating how gene mutations in the nervous system relate with microbes in the gut," Hill-Yardin adds. "We know these microbes interact with the brain via the gut-brain axis, so could tweaking them improve mood and behavior?"

While this wouldn't reverse the gene mutation, it may allow researchers to tone down its effects, and make a real difference in the quality of life for people with autism and their families, Hill-Yardin says.

Previously a study published in the Journal of Autism and Developmental Disorders found that gastrointestinal (GI) distress could be the source of anger, aggression and other troubling behavioral problems in children with autism. While a recent pilot study from Kyoto Prefectural University of Medicine (KPUM) in Japan found that soluble guar fiber may help improve constipation and by extension irritability in children within the autism spectrum.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Coffee contradictions? Drinking 25 cups a day not linked to stiffer arteries, new research reveals

British Heart Foundation-backed study claims that coffee is not as bad for heart and circulatory system as previously believed

03 Jun 2019 Nutrition Insight

Drinking coffee, including extremely high volume consumption, is not linked with stiffer arteries and is not as bad for the heart and circulatory system as previously thought, according to new research.

A study by Queen Mary University of London, partly funded by the British Heart Foundation (BHF), involved 8,412 people in the UK and debunks previous scientific claims that drinking coffee increases arterial stiffness. Previous suggestions that drinking coffee leads to stiffer arteries are "inconsistent and could be limited by lower participant numbers," according to the team behind this new research. "Understanding the impact that coffee has on our heart and circulatory system is something that researchers and the media have had brewing for some time," says Professor MetinAvkiran, BHF Associate Medical Director. "There are several conflicting studies saying different things about coffee, and it can be difficult to filter what we should believe and what we shouldn't. This research will hopefully put some of the media reports in perspective, as it rules out one of the potentially detrimental effects of coffee on our arteries," he adds. The research, which was recently presented at the British Cardiovascular Society (BCS) Conference in England, involved more than 8,000 people in the UK.

Consumption was categorized into three groups for the study. Those who drink less than one cup a day, those who drink between one and three cups a day and those who drink more than three. People who consumed more than 25 cups of coffee a day were excluded, but no increased stiffening of arteries was associated with those who drank up to this extremely high limit when compared with those who drank less than one cup a day, according to the research. Contributing factors like age, gender, ethnicity, smoking status, height, weight, alcohol consumption, diet and high blood pressure were all taken into consideration.

As the body of research examining the pros and cons of coffee consumption grows, there continues to be a mixed bag of findings raising questions over which advice to follow. Last month, a study from the University of South Australia (UniSA), published in The American Journal of Clinical Nutrition, claimed that consuming six or more coffees a day may increase the risk of heart disease by up to 22 percent.

This study marked the first time an upper limit has been placed on safe coffee consumption in relation to cardiovascular health. The researchers note that more research on the matter is warranted to determine whether other aspects of health are affected by coffee consumption and also to determine the varied individual responses to caffeine.

The bright side of dark roast

Last month the purgative properties of coffee were examined in a US study which pinpointed the specific reason or mechanism why coffee is associated with accelerated bowel movement. "Despite the huge popularity of coffee worldwide, different reports could put people off from enjoying it. While we can't prove a causal link in this study, our research indicates coffee is not as bad for the arteries as previous studies would suggest," adds Dr. Kenneth Fung, who led the data analysis for the research.

"Although our study included individuals who drink up to 25 cups a day, the average intake among the highest coffee consumption group was five cups a day. We would like to study these people more closely in our future work so that we can help to advise safe limits."

The morning staple loved around the world is, however, also linked to several beneficial health outcomes, according to emerging science. Certain compounds found in coffee, called phenylindanes, may hinder two protein fragments responsible for Alzheimer's and Parkinson's from clumping, therefore potentially aiding in the prevention of these diseases, researchers from the Krembil Brain Institute have found. In addition, certain coffee compounds may inhibit the growth of prostate cancer, according to a recent pilot study, carried out on drug-resistant cancer cells in cell culture and in a mouse model.

Another study from last April also says that light roast coffee holds anti-cancerous properties that darker roast coffee does not. The study, published in The Journal of Food Science, compared coffee roasted at five different levels, against the growth inhibitory activity of cancer cells that are associated with oral and colon cancers. One point that is not in debate, however, is that more work is needed to establish the full range of potential health benefits and risks associated with coffee consumption.


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Nutrition: Even identical twins respond differently to food

Medical News Today 20 June 2019 By Ana Sandoiu

The largest ongoing study of its kind finds that people's responses to food vary depending on a wide variety of factors. The findings suggest that the future of nutrition lies in personalized dietary advice.

New research shows why doctors need to personalize nutritional advice. Despite repeated public awareness campaigns and official dietary recommendations, the obesity epidemic is a persistent problem in the United States, and obesity-related conditions such as metabolic syndrome are a growing concern. The lack of personalized dietary advice may partly be the reason for this. For instance, one study pointed out that giving specific weight loss tips and having an empathetic approach toward those trying to lose weight can be much more beneficial than simply telling someone to improve their diet.

Another intriguing study in mice pointed to genes as a key factor that may determine which diet works. At the time, the researchers concluded that if they could replicate the same findings in humans, they would prove that "precision dietetics" may work a lot better than the standard "one-size-fits-all" approach. Now, groundbreaking research does just that. Drawing from a large twin study, scientists have expanded the findings by conducting a nutritional response study with applied machine learning algorithms to show that one size really doesn't fit all when it comes to a person's diet. In fact, the new study reveals that even identical twins respond differently to food.

These findings are part of what is the largest ongoing scientific study of its kind, which researchers at King's College London (KCL) in the United Kingdom and Massachusetts General Hospital in Boston — in collaboration with nutritional science company ZOE — carried out. The team presented the first results of this ongoing research at both the American Society of Nutrition conference (which took place in Baltimore, MD) and the American Diabetes Association conference (which took place in San Francisco, CA).

Tim Spector, a professor of genetic epidemiology at KCL, led the TwinsUK Study, which provided the foundation for this large new project. Prof. Spector is also the scientific founder of ZOE. Studying people's responses to food
In the TwinsUK study, Prof. Spector and team examined 14,000 identical and nonidentical twins in an effort to understand the causes of various chronic conditions and distinguish between what may be genetic or environmental triggers.
Secondly, as part of the large-scale new research project called "PREDICT 1," Prof. Spector and colleagues expanded on the TwinsUK findings by examining the biological responses that 1,100 participants had to certain foods over a period of 14 days. Around 60% of these participants were twins.

The researchers measured markers such as blood sugar levels, triglycerides, insulin resistance, levels of physical activity, and the health of their gut microbiome. The participants registered factors including their food intake and hunger levels using an app. The researchers also intensively monitored their sleep and exercise activities and took their blood samples.

Speaking to Medical News Today, Prof. Spector shared additional details about how the team conducted the study. "The study uses an app specially designed to collect the most detailed and robust dietary data ever collected before at this scale," he said. "Uniquely, the app combines dietary assessment technology with real-time support from a team of nutritionists, ensuring that the best quality detailed dietary data [are] collected." "[M]achine learning allows us to combine all [these] data to predict an individual's personalized responses to food," Prof. Spector added. "The more people who participate, the better those predictions become."

Identical twins respond differently to food

The results showed that people's biological responses to the same meals varied widely. This was true regardless of whether the meals contained carbohydrates or fat.

For instance, some people had spikes in blood sugar and insulin levels — both of which are implicated in weight gain and diabetes. Others showed spikes in triglycerides that lasted for hours after a meal. Some research has linked triglycerides with heart disease. Importantly, genes did not fully explain these variations. In fact, less than 50% of the variation in blood sugar, less than 30% of the variation in insulin, and less than 20% of the variation in triglycerides were down to genes.

Also, the scientists "found out that identical twins shared 37% of the bacteria in their gut — only slightly higher than the 35% shared between two unrelated individuals," Prof. Spector told MNT. Despite having the same genes and exposure to similar environments, identical twins often had very different glucose responses to set meals, whether they were high in carbs, fiber, fat, or sugar.

Surprisingly, the research also revealed that the information on the foods' nutritional labels — such as fat, protein, and carb content — accounted for less than 40% of the difference between people's biological responses to foods with a similar calorie content. These results, the team explains, suggest that factors including individual differences in people's metabolism, gut microbiome, schedules, meal timings, and physical activity levels are just as important as the nutritional content of the food.

A 'shift' in the world of nutrition
"In the world of nutrition, there's a real shift happening," Prof. Spector told MNT. "People are finally starting to reject the notion that if everyone just follows the general guidelines (five servings of vegetables, counting calories, reducing fat) they'll be healthy forever."
"There's also a lack of clarity around the impact of food choices on health and disease, or the best nutritional plan that each individual should follow to optimize their health and control weight."
"This research shows us for the first time just how much our responses to food can be modified; that it's not all determined by our genes or the nutrient composition of the meal." Prof. Tim Spector
"This is really exciting," he said, "as this means we have the power as individuals to change how we respond to food and to choose the food that is best for us as individuals." He also shared with us his team's future plans. "For the remainder of this year," he said, "we are expanding ZOE's PREDICT study in collaboration with Stanford University and Massachusetts General Hospital, and we are enrolling 1,000 volunteers across the U.S. to participate from home."
"We will continue to collect a wide dataset from as many people as possible to develop better research and help even more people understand their responses to food so they can make their own decisions."
"In 2020, we are planning to launch the home test and app, which will help individuals understand their unique responses to any food so they can optimize their metabolism."

Colon cancer: Could yogurt prevent precancerous growths?

Medical News Today 20 June 2019 By Maria Cohut

New observational research indicates an association between a lower risk of precancerous growths (adenoma) in the bowel and yogurt consumption patterns — in men, at least.

Men who eat yogurt may have a lower risk of precancerous growths in the bowel. Estimates from the National Cancer Institute (NCI) indicate that there will be 145,600 new cases of colorectal cancer in the United States in 2019. The NCI also note that around 4.2% of adults will receive a colorectal cancer diagnosis during their lifetime. Although many factors can contribute to a person's risk of developing colorectal cancer, one of the most prominent ones is a poor diet.

By the same token, however, following a healthful diet may help keep this form of cancer at bay. It remains unclear as to which dietary factors are most helpful in protecting people from colorectal cancer. For this reason, recent studies have started by investigating the association between different foods and the risk of tumors or precancerous growths. The latter, called "adenomas," are growths that are usually benign; however, some of these have the potential to develop into malign, or harmful, tumors.

Researchers from the Harvard T.H. Chan School of Public Health in Boston, MA, and many collaborating institutions have now found a link between a reduced risk of adenomas in men and a high consumption of yogurt. These results appear in the BMJ journal Gut.

19% lower risk for men who eat yogurt
"[Some researchers have] underscored the urgent need to identify new modifiable factors for colorectal adenomas, [and a] few studies reported that higher yogurt intake may reduce the risk of colorectal cancer, potentially mediated by the gut microbiome."
"However, no study has yet evaluated the association between yogurt intake and precursors of [colorectal cancer]," the study authors explain in the introduction of their paper.

Image © iStock.com/ OcusFocus

To investigate the link between yogurt consumption and the risk of developing precancerous bowel growths, first study author XiaobinZheng and colleagues analyzed information concerning diets and adenoma formation in the case of 32,606 men and 55,743 women.
The researchers sourced the data from the Health Professionals Follow-Up Study and the Nurses' Health Study, respectively.

All the participants agreed to have a lower bowel endoscopy in 1986–2012. This procedure allows doctors to detect the presence of any abnormal growths inside the lower part of the bowel.
Also, all the participants had provided information regarding their lifestyles and dietary habits once every 4 years. This included information regarding yogurt consumption.

Throughout the study period, the researchers documented the development of 5,811 adenomas among the men and 8,116 adenomas among the women. Men who reported consuming two or more servings of yogurt per week were 19% less likely to develop precancerous growths in the bowel (conventional adenomas) compared with men who reported eating no yogurt at all.

Moreover, men who ate two or more servings of yogurt per week were 26% less likely to develop abnormal growths with a high likelihood of developing into malignant tumors in the colon (not the rectum).
The scientists saw no associations between yogurt consumption and the development of serrated adenomas (premalignant lesions) measuring under 1 centimeter (cm); however, they report a probable association with a lower risk of developing large serrated adenomas measuring 1 cm or more

Zheng and team found no associations between yogurt consumption and the risk of adenomas in women.

Yogurt may have anti-inflammatory effects

Although this was an observational study — meaning that it can only establish associations and does not speak of cause and effect relationships — its authors believe that the fact that they found this link in such a large cohort does indicate a potential for causality.
However, why might yogurt consumption help prevent the formation of abnormal growths in the bowel? The researchers have a few theories.
"Products of the two common probiotics used in yogurt, Lactobacillus bulgaricus and Streptococcus thermophilus, may reduce levels of carcinogens such as nitroreductase, fecal activated bacterial enzymes, and soluble fecal bile acids," they hypothesize.
Also, "[t]he stronger link between yogurt intake and colon versus rectal adenomas may in part [be] due to the lower pH in the colon, which is more hospitable for probiotics," they write.

They also link yogurt consumption with lower levels of inflammation: "Yogurt may also reduce adenoma risk by exerting anti-inflammatory effects on colon mucosa and ameliorating gut barrier dysfunction."

In the future, the team aims to conduct further research into the possible mechanisms underlying the links between yogurt consumption and lower cancer risk. The study received a number of research grants, many of which came from the National Institutes of Health (NIH). Only one of the study authors (Charles Fuchs) declared potential competing interests; he is a consultant for various pharmaceutical and biotechnology companies, including Bayer, Gilead Sciences, and Pfizer.

Foods with similar nutrition content affect the gut differently

Medical News Today 17 June 2019 By Monica Beyer

Foods with similar nutrition labels can have very different effects on gut microbiomes, research finds.

Foods that have similar nutritional information on their labels can affect the gut microbiome of different people in different ways. A recent study, the results of which feature in the journal Cell Host & Microbe, looked at participants' diets and stool samples over the course of 17 days to examine the discrepancies between how different foods influence the gut microbiome, even when they seem to be nutritionally similar.

A healthy human gut microbiome includes a wide variety of diverse bacteria, and the scientific community has been interested to see how the gut microbiome relates to both health and disease. For this study, the researchers recruited a total of 34 participants whom they instructed to record everything that they ate for 17 days. The team collected stool samples daily.

To discover how each participant's microbiome changed every day in response to the food that they ate, researchers performed shotgun metagenomic sequencing on the stool samples. Doing this also allowed them to note the effects of microbiome changes on enzymes and metabolic functions.

How nutrients can alter the gut microbiome

Before the research began, the study authors believed that they would be able not only to identify links between certain dietary nutrients and specific strains of microbes but also to determine why microbiomes differ among individuals. However, they found instead that foods that shared a comparable nutritional profile did not necessarily have a similar effect on the microbiome.

Senior author Dan Knights, who works in the Department of Computer Science and Engineering and the BioTechnology Institute at the University of Minnesota in Minneapolis, notes that these findings presented a different challenge. "We had to scratch our heads and come up with a new approach for measuring and comparing the different foods," he explains. The researchers then developed a structured hierarchy of foods, which allowed them to identify closely related foods that they could share statistical data across.

They found that related foods, for example, the leafy greens spinach and kale, had a comparable effect on the microbiome, while foods that were not closely related but had very similar nutritional profiles differed in their effects.

Nutrition labels at a glance

Manufacturers pack a lot of information into a nutrition label, and it can help people choose what to eat and what to avoid. For example, every nutrition label in the United States notes what constitutes a serving size, and following that, what each serving size contains.

Amla extract (Capros) may boost endothelial function, immune response and more: RCT

By Stephen Daniells
24-Jun-2019 –Nutra Ingredients Asia


Image © iStock.com/anatchant

Daily supplements of an extract from amla (Phyllanthusemblica) may improve the health of cells lining the blood vessels, reduce markers of oxidative stress, and boost immune responses in people with metabolic syndrome, says a new study.

Data from the randomized, double-blind, controlled study with 59 people with metabolic syndrome indicated that 12 weeks of supplementation with 500 mg twice a day of the Amla extract led to 11% reduction in total cholesterol, 21% reductions in LDL-cholesterol, 19% reductions in triglycerides, and 7% increases in HDL cholesterol.

The amla extract was also associated with significant improvements in markers of oxidative stress, inflammation, with benefits also recorded for a lower dose (250 mg twice a day), according to findings published in the BMC Complementary and Alternative Medicine. “We suggest that Phyllanthusemblicabe used as an adjunct to conventional treatment (lifestyle modification and pharmacological intervention) in the management of MetS,” wrote the researchers. Metabolic syndrome (MetS) is a condition characterized by central obesity, hypertension, and disturbed glucose and insulin metabolism. The syndrome has been linked to increased risks of both type 2 diabetes and cardiovascular diseases.

Capros

The study used a standardized aqueous amla extract commercialized by New Jersey-based Natreon, and branded as Capros for the food, beverage and dietary supplements market. This marks the 12th clinical trial published by Natreon for its amla extract, said the company. Commenting on the new study, Dr Sanni Raju, CEO of Natreon, stated: “This latest trial once again has shown the ability of Capros to improve vascular health, reduce oxidative stress, improvethe lipid profile, especially byreducing the LDL and triglycerides. It also has shown to enhance immune response by reducing hsCRP and improve blood flow. “Capros is a totally natural and vegan edible fruit aqueous extract and when combined with its recently issued US Patent (8,962,576) on composition and methods for improving endothelial function and cardiovascular health, Capros’ solubility, stability and taste, make it an ideal heart health product for capsule, powder and beverage formations.”

For the new study, the researchers randomly assigned men and women with an average age of 57 to one of three groups: One group received placebo, while the other two groups received the Capros supplements at a dose of either 250 mg twice daily or 500 mg twice daily.


Image © iStock.com/szefei

At the end of the four-week intervention period, the researchers found that both dosages led to significant improvements in endothelial function (a marker of vascular health), markers of oxidative stress (including nitric oxide, glutathione, and malondialdehyde), and systemic inflammation biomarker (hsCRP decreased by almost 40% in the lower dose group and by almost 54% in the higher dose group), compared to baseline and placebo.

Significant improvements in cholesterol and triglyceride levels were also recorded, said the researchers. "Both 250 mg twice daily and 500 mg twice daily doses had significantly better effect than the placebo; however, the 500 mg twice daily dose was significantly more efficacious than the 250 mg twice daily dose," they wrote. "Further studies in a larger population are warranted to address whether administration of Phyllanthusemblicamay lead to a novel therapeutic alternative in improving the components of metabolic syndrome."

Chew for health: Australian firm's swallowable gum also delivers gut health gains

By Pearly Neo 20-Jun-2019 –Food Navigator Asia

Australian Food and Pharmaceutical Industries (AFPI) has launched a science-based chewing gum that aims to not only cleanse the mouth and eliminate bad breath, but also help heal the gut.

Mast Chew is made of pistachio resin, essential mint oil and xylitol, making it plant-based and sugar-free. Speaking to FoodNavigator-Asia at the Naturally Good Expo 2019 Business Summit, AFPI founder and CEO Dr Sharif told us that the gum also contains nothing artificial, including the commonly added food additive E171, or titanium dioxide. Titanium dioxide is found in over 900 common food products , and a recent University of Sydney study demonstrated not only that it is found in 'high quantities' in these products, and is as such consumed 'in high proportion everyday by the general population' , but also that it significantly increases the risk of cancer and gut diseases.

"Conventional chewing gum has titanium dioxide, which was recently banned in France for carcinogenic properties, but Mast Chew does not," he said. "It is also digestible when swallowed, and in fact we do recommend swallowing it – it has been scientifically proven to be assist in the healing of stomach ulcers."

Pistachio resin has been the subject of multiple studies and found to show antimicrobial properties. It has been traditionally used throughout the Mediterranean and Middle East for thousands of years for gut health maintenance and the treatment of gut issues like stomach, gastric and intestinal ulcers as well as heartburn "Mast Chew is exceptionally effective in dealing with the bacteria Helicobacter pylori," added Dr Sharif, who comes from a medical background and has also published multiple papers on the antimicrobial activity of pistachio resin. H. pylori is a common cause of peptic ulcers and gut inflammation. It is known to be present in some 40% of all Australians and some 50% of the global population, although many are dormant carriers without exhibiting symptoms, and are as such unaware.

Ambient challenges

Mast Chew is currently available in Australia, Canada and some areas in the Middle East and South Africa. Responding to queries about the possibility of expanding to the South East Asian market, Dr Sharif said that although there was interest, this is currently very challenging as the product was sensitive to temperature and moisture. "It is necessary to keep Mast Chew in cool temperatures below 20°C, and it also wouldn't be able to maintain structural integrity in humid places like Singapore or Malaysia," he explained.

Moving forward

Although Dr Sharif was coy on revealing details, he told us that upcoming innovations and NPD from the company include using the chewing gum as a delivery medium for drugs. "In addition to its natural antimicrobial properties, the gum could also be used as a carrier vehicle for things like medicines or vitamins," he said.


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Sensor monitors shelf life of milk

IFT Next Newsletter June 11, 2019

Consumers are sometimes confused about whether or not to discard milk that is past its expiration date but still smells fresh.

Now, thanks to a sensor developed by researchers from Washington State University's Department of Biological Systems Engineering (BSE) and the WSU/University of Idaho School of Food Science, expiration dates may become obsolete.

The researchers were interested in exploring ways to promote food safety with refrigerated foods, which can experience temperature abuse during handling, transportation, and storage, thus compromising safety and quality, and affecting shelf life.

"We thought about developing low-cost sensors that can be incorporated in the primary packaging, which are able to directly interact with the food environment and sense food quality," says ShyamSablani, professor in BSE.

A low-cost sensor could provide valuable information about the product's shelf-life and potentially minimize economic losses.

Sablani and his team decided to work with fluid milk, which is widely consumed and must be stored at refrigerated temperatures. When it spoils, milk produces volatile organic compounds (VOCs), which the research team identified and quantified under refrigerated and temperature abuse conditions (4° to 19°C).

Next, the team selected a reagent that interacts with the VOCs and changes colour. Nanoparticles were coated with the reagent to create the nano-sensor.

"The nanoparticles provided a large surface area; hence, a very small amount was sufficient to carry the reagent needed to react with VOCs," explains Sablani. "During storage, the VOCs generated by microbes in the milk interact with the nano-sensor to produce a colour change from pink to purple."

Sablani says the researchers "are planning to work with food and packaging companies to commercialize the sensor."

The next state of their research includes fine-tuning the chemistry of the nanosensor "to improve its colour change sensitivity and figure out creative ways to incorporate the sensor in package closures."

Image © iStock.com/Image Source

Do images of food on kids' clothes influence eating behaviour?

Science Daily June 4, 2019

Frosted cupcakes, sprinkled donuts and chocolate chip cookies -- all on the list of foods that pediatrician Megan Pesch suddenly found difficult to avoid.

Not at the bakery or grocery store, but on children's clothing.

The mother of three daughters couldn't help but notice that food graphics had become fashionable -- from sleep sacks and pajamas adorned with pink and purple donut patterns to T-shirts decorated with ice cream cones and cutesy sayings about being "sweet."

Pesch, M.D. a developmental behavioral pediatrician who studies childhood eating behaviors at University of Michigan C.S. Mott Children's Hospital, wondered how prominent the trend was and whether it had implications for children's eating habits. "I started thinking about how food graphics on clothing may impact kids' identification with food starting as early as when they're babies," Pesch says. "Could food on apparel be another influence on food preference and eating behaviors?"

"Turning our kids into walking billboards of junk food reinforces the appeal of these foods," she says. "Whether intentional or not, we are sending positive societal messages about consuming unhealthy food to children and their parents that may influence unhealthy eating behaviors long term."

Unhealthy foods

In a new analysis published in journal Eating Behaviors, Pesch and colleagues looked at 3,870 clothing items over a month-long period in 2018 from four major children's retailers. One in 11 apparel items included food graphics and two-thirds of those foods were unhealthy while others had healthier options, such as fruit. A third of the items featured food graphics "having fun," such as a pizza slice riding a skateboard.

Gender differences were blatant. While girls' clothing mostly brandished pastries and desserts, boys' clothes were more likely to include fast food and salty categories like pizza, hot and fries. “That may underlie some of these cultural expectations of girls' characteristics versus boys' behavior, specifically that girls are expected to be 'sweet,'" Pesch says.

Other studies have suggested that children's food preferences and eating behaviors are associated with social influences. Children are more likely to taste or eat a food paired with an image of a character, for example. Indeed, mascots and cartoon characters have often been used in food marketing to increase a brand's appeal to children.

There has been less attention to non-brand specific graphic items such as clothing with food icons, Pesch says.

Food as characters

But many food graphics included in the analysis were portrayed as characters. Examples include a dinosaur with a thought bubble thinking about a hamburger, a sequined ice cream cone carrying a purse and soda and fries high-fiving with the word "besties." Or the shirts that featured unicorns, rainbows and a cupcake with the phrase "Dream Big" and a chocolate chip cookie dancing with a glass of milk.

Sayings such as "More Donuts, More Pizza, More Vacays," "Donut Worry Be Happy" and "Always S'More Fun with You" are other examples.

Clothing is believed to be a powerful medium that may influence children's self-identity and graphics portraying unhealthy food as "fun, silly and positive" doesn't seem to be going away, Pesch notes.

Donuts, pizza and other junk food items are also showing up more on other kids' items, such as inflatables, toys and gift wrap.

Image © iStock.com/ igorr1, zoljo


Image © iStock.com/grafvision

Persist into adulthood

Research suggests that food preferences and eating behaviors established in childhood often persist into adulthood, authors say. It is unknown what messages children may internalize when wearing food-graphic clothing, and if this influences children's food preferences but it should be explored in future research, they say.

"There is nothing wrong with a donut or cookie once in a while. They are 'sometimes foods' and completely fine in moderation," Pesch says. "But children's association and relationship with food begins developing at a young age. Obesity is much more easily prevented than it is treated."


Image © iStock.com/kmk-vova

"We spend a lot of time studying how children develop eating habits and food preferences and what we can possibly do early on to prevent obesity," she says. "Food graphics on children's products may provide insights into how society shapes children's emotional relationships with food and reinforces obesity-promoting messaging."

Vanilla makes milk beverages seem sweeter

Science Daily
June 20, 2019

Adding vanilla to sweetened milk makes consumers think the beverage is sweeter, allowing the amount of added sugar to be reduced, according to Penn State researchers, who will use the concept to develop a reduced-sugar chocolate milk for the National School Lunch Program.

“We are utilizing a learned association between an odor and a taste that will allow us to reduce the added sugar content," said Helene Hopfer, assistant professor of food science. "Reducing added sugar in products, just like reducing fat and salt, is the holy grail of food science."

The idea that congruent or harmonious odors enhance certain tastes is not new, explained Hopfer, whose research group in the College of Agricultural Sciences has been experimenting with these "cross-modal interactions" in food since she came to Penn State three years ago. Her goal is to see them actually incorporated into foods.

In a blind taste test that provided new insights into taste enhancement by an aroma, participants -- who did not know vanilla had been added to the milk -- consistently indicated that samples with vanilla were significantly sweeter than their added sugar concentrations could explain.

The subjects' responses indicate that with the addition of vanilla, the added sugar content in flavored milk could potentially be reduced by 20 to 50 percent, suggested lead researcher Gloria Wang, and people should not be able to perceive the beverage as less sweet.

"We maintain the sweetness perception by having this congruent odor -- this learned, associated odor -- basically trick the brain into thinking that there is still enough sweetness there," she said. "Based on our results, taste-aroma interaction is a robust effect.”

Wang, now an associate scientist in product development with Leprino Foods Co. in Colorado, conducted the research at Penn State as part of her master's degree thesis in food science.

She tested not only congruent taste-aroma combinations but incongruent combinations as well. It turned out that even a beef odor in milk slightly enhanced sweetness for study participants.

Given widespread concerns about sugar intake and health, manufacturers are reformulating their products to help address consumer demand, Wang noted.

She believes the findings of the research, recently published in Food Quality and Preference, offer them a workable option to reduce added sugar in their products and retain the sweetness consumers demand.

The study was novel because it did not ask participants to rate individual attributes of the milk such as sweetness, intensity of vanilla odor or milk taste. Instead, participants took a more holistic approach and simply selected the best match for the vanilla milk from four differently sweetened milk choices.

Later this summer, Hopfer's lab in the Department of Food Science will start working on a two-year project, funded by the National Dairy Council, aimed at developing a reduced-sugar chocolate milk for the National School Lunch Program. The effort, based on the recent research using the synergistic actions between vanilla and sugar to reduce the added sugar content, will be a challenge because of the inherent bitterness of cocoa.

"The amount of sugar in chocolate milk is quite high because cocoa is very bitter, so you need some sugar to decrease the bitterness of the cocoa and then more to make it sweet," Hopfer said. "We are hoping to utilize what we found with odors to reduce the added sugar content by experimenting to find the sweet spot between cocoa powder, sugar content and vanilla flavor. We know that if it isn't sweet, children won't drink it."

Also involved in the research were Alyssa Bakke, staff sensory scientist in food science, and John Hayes, associate professor of food science and director of the Penn State Sensory Evaluation Center.
The U.S. Department of Agriculture's National Institute of Food and Agriculture supported this work.

Image © iStock.com/ JohnnyGreig

Healthy senior life: Nutraceuticals market opportunities in Asia estimated at US$205 billion

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Preventive measures and education present a US$205 billion opportunity for the nutraceuticals industry in Asia. Healthcare expenses could surge by nine times the current rates in certain Asian countries, according to estimates.

The healthcare industry has been outstripping GDP growth in most Asian countries and by 2030, over 60 percent of the world's population – around 500 million people – will be aged 60 or above in Asia. To tackle the economic ramifications of the issue, such as the rising costs of healthcare, governments across Asia are developing new strategies that address and promote healthy aging.

Food fortification programs are extremely cost-effective in addressing both over- and undernutrition as they cost as little as US$50 per disease. Temasek – an investment company headquartered in Singapore – referencing multiple sources, estimates that by 2030 in Asia, the markets for food fortification will be US$125 billion. According to the World Health Organisation (WHO), healthy aging is "the process of developing and maintaining the functional ability that enables wellbeing in older age." Noncommunicable diseases (NCDs), such as cardiovascular diseases (CVD), cancers, chronic respiratory diseases and diabetes are taxing the healthcare system. Incidences of NCDs and their associated requirements for long-term care increase with age, compounded by increasing life expectancy, which means that requirements for long term care are sustained over a higher number of years compared to in previous generations. Furthermore, according to WHO, 70 percent of deaths globally result from NCDs, particularly cancer and from issues related to obesity, such as heart disease, stroke and diabetes.

NCDs can be prevented through better health and nutrition. Research studies in the US show that every US$1 invested in preventative healthcare can save US$5 in treatment cost.

The healthcare industry has been outstripping GDP growth in most Asian countries and by 2030, over 60 percent of the world's population – around 500 million people – will be aged 60 or above in Asia. As we age, our metabolism decreases and we require less energy, but our need for nutrients increases. Our societal thirst for fast food and satiety has resulted in a prevalence of fatty, salty and sweet foods, which have rapidly become part of our staple diet and yet do not deliver sufficient nutritional value. Better nutrition ultimately aids healthy aging by improving nutrient deficiencies that could impact long-term health and fitness.

In light of this, governments are promoting the benefits of nutraceutical products such as fortified food, reformulated food and functional food that offer nutritional supplements and assist in treating or preventing disease (apart from anemia), to provide medical benefits.

Considered measures to tackle health problems through nutrition include programs such as national nutrition plans in China; school lunch programs in India that are interventions to prevent child malnutrition; stipulating through regulation in Malaysia to restrict access to high-calorie products through food-zoning, which controls the type of food sold in certain areas and makes sure that calorie information is on display; higher taxes on high-sugar and high-fat food; or even, incentive programs for Singapore workers to persuade consumers to choose healthier food options.

Global food companies are removing sugar and artificial preservatives by reformulating products to be healthier. Local brands in China, South Korea and Vietnam are reformulating products with locally sourced medicinal ingredients such as red ginseng and cooling herbs. The product reformulation market in Asia is estimated at US$65 billion.

And the functional food market, or food that is fortified and enhanced to provide substantial health benefits, is estimated at US$15 billion. Among other ingredients, they may contain probiotics, prebiotics, plant stanols, and vitamins such as B, D and minerals such as folic acid.

Vitafoods Asia 2019

To enable Asians to explore nutraceuticals, the Vitafoods Asia 2019 Conference and Exhibition will be held in Singapore, September 24-25, 2019. The nutraceutical event for the Asia Pacific region, Vitafoods Asia informs and helps brand owners to select, manufacture and distribute products from the global nutraceuticals industry. Some 44 percent of the more than 5,000 visitors that attended Vitafoods Asia in 2018 sought products and information on healthy aging.

Vitafoods Asia showcases evidence-based products that combat malnutrition, disease and low immunity, along with the ill effects of obesity, smoking, alcohol consumption, stress and a lack of exercise. The exhibition features functional beverages and food, dietary and health supplements, health food, natural and herbal medicines, and "nutricosmetics" that are beneficial to healthy aging. Over 350 international suppliers attend to provide innovative and high-quality nutraceutical ingredients, dietary supplements and services to buyers from Asia.

Vitafoods Asia connects suppliers to buyers, as well as service providers to brands, who can also access product development, regulatory and marketing entry advice at the show to learn how to penetrate new markets in Asia. Exhibitors include digestive health sponsor, DuPont, Collagen Protein sponsor, Gelita, healthy aging sponsor, DSM, Curcumin sponsor, Sabinsa and GenCanna, the official Cannabidiol (CBD) sponsor for Vitafoods Asia 2019.

Consumer sweet spot: Do sweeteners present a nutritious solution to the sugar reduction "megatrend?"

Improved sweeteners education is needed for consumers to better understand their benefits, says industry exec

17 Jun 2019 Insight

Sugar reduction has become an established industry "megatrend," in part driven by rising consumer awareness on the adverse health outcomes relating to high sugar consumption, as well as sugar taxes driving product reformulation.

This is also stimulating NPD as industry is turning towards alternatives to keep up with the demand for healthier, yet just as sweet, formulations. The rise of sweeteners such as allulose, stevia and sucralose provide a solution and aside from being low in calories, some sugar alternatives are also being hailed for their nutritional benefits.

"The market should base its conclusions [on sweetener's nutritional properties] on scientific findings," Philippe Chouvy, Business Development Manager, Sweeteners at Cargill, tells NutritionInsight. According to Chouvy, currently, there is no evidence linking caloric sweeteners in the development of obesity, diabetes and lipid-related chronic disease.

"Natural, low-calorie sweeteners, such as stevia, can be 300 times sweeter than sugar and allow consumers to enjoy sweet tasting products with minimal calories," Katharina Pueller, Director of Natural Sweetener Business at Sweegen, tells NutritionInsight.

Consumer research on sugar alternatives

The reduction in calorie intake in a consumer's diet can reduce the risk of obesity and improve their health and well-being. Stevia, for example, contains steviol glycosides which are rich in folic acid, antioxidants, and amino acids which are essential to a healthy lifestyle, Pueller adds.


Image © iStock.com/Rocky89

In an Innova Consumer Lifestyle and Attitudes Survey (2018), nearly seven out of ten consumers across the countries surveyed (US, UK, France, Germany, China and Brazil) reported having reduced their sugar intake. This is particularly prevalent among the over 55 age group, with consumers in France and Brazil the most likely to be reducing sugar in their diet. The consumer survey also found that this trend is most robust in the UK and US, where 57 percent and 52 percent of consumers respectively claim to have cut down on sweet snacks.

Last year, the findings of a Kerry-endorsed research on sweetening agents revealed that 71 percent of US consumers now read the label for sugar content, while 46 percent surveyed want to slash their sugar consumption. The company surveyed more than 760 US consumers, measuring their perceptions of 17 sweetening agents to understand attitudes, preference and ideal sweetening agents across six categories.

Consumer perception of the various sweetening agents either skewed strongly natural or strongly artificial. Stevia was the only sweetener that had mixed opinions; 46 percent of consumers reportedly believed it to be a natural sweetener, while 54 percent deemed it artificial. Kerry's research indicates that US consumers prefer naturally derived sweetening agents.

Traditional sources – honey, sugar, maple syrup – were most preferred, while perceived artificial or unfamiliar sweetening agents – erythritol, acesulfame-K and monk fruit – were least preferred. However, familiarity with a sweetening agent did not guarantee preference. "High fructose corn syrup, molasses, agave and aspartame had a higher awareness ranking but scored much lower as a preferred source," the report concluded.

"Consumers need access to clear and consistent information in order to make informed choices about the foods they purchase and consume. The disclosure of meaningful nutrition information currently on package labels and other points of purchase can help consumers achieve a healthy diet," Chouvy notes.

Nutritionally important or just harmless?

Sugars are an important source of energy, needed so our body and brain can function optimally. When consumed in moderation, sugars can be part of a varied and healthy diet, says Chouvy. "At Cargill, we offer an extensive portfolio of nature-derived food energy options on the market, ranging from full-calorie to zero calorie sweeteners," he adds.

Stevia plantAccording to Pueller, non-nutritive, nature-based sweeteners are already contributing to reformulations of existing products and new product launches.

The megatrend of sugar reduction has led R&D professionals and product developers to become experts about alternative sweeteners, knowing their functionality and characteristics. However, the sweetener industry needs to educate marketers and consumers on the benefits of using the next generation of stevia-based sweeteners and they have to taste the products, Pueller notes. "The nutritional and health effects of caloric sweeteners are based on typical use and consumption levels but also other factors, such as food form, nutrient density, meal and overall diet composition, caloric content and lifestyle factors, such as exercise level," explains Chouvy.

The combination of these factors can affect how a particular sweetener impacts health and diet-related diseases. "Thus, we believe the focus should be on the overall nutritional quality of the diet, rather than pinpointing to one particular food or nutrient," he notes.

In the period 2012-2017, Cargill replaced more than 500 million pounds of sugar globally with its stevia products and 2 billion pounds of sugar globally, with its stevia and polyol products combined.

Hurdles in reformulation

Reducing sugar in existing market products can be a challenge as heavy users will detect even slight changes to a product, Pueller says. Reducing sugar requires a rebalancing of the product's flavor and mouthfeel to match its original taste. In addition to the taste challenges, the change requires extensive consumer testing. "We find most clients launch low calorie or zero calorie products with stevia-based sweeteners under new branding," she explains. "Reformulation of foods and beverages to reduce levels of calories/sugar without sacrificing appearance, flavor, physical and textural attributes, cost and maintaining a clean label is challenging," notes Chouvy.

The reality is that sugar plays many roles. In addition to providing sweetness, it also acts as a preservative – helping to extend the shelf life of foods and as a fermentation substrate. It is also important in the texture, structure, color, mouthfeel, viscosity and flavoring of foods.

"Therefore, the reformulation of foods to reduce calories/sugar doesn't simply involve the removal

of a single nutrient and often the nutrient removed will have to be replaced with another substance," Chouvy says. "This often results in longer ingredient lists and less label-friendly options. In this sense, product reformulation is also an opportunity requiring specialists with knowledge and a combination of the right ingredients to reach the desired goal."

A trend that is here to stay?

Sugar reduction is a major trend with staying power, and the use of a stevia-based, non-GMO alternative to build sweetness will remain popular, predicts Pueller. "Non-nutritive sweeteners allow reduction of calories while providing the sweetness we all have come to love. The future will bring an increasing number of consumers that watch their sugar intake carefully, but also an opening of regulatory agencies to accept novel, healthier alternatives," she adds.

In Europe, the trend of overall sugar and energy reduction, such as less salt, sugars, fats and calories, is dominating the market, according to Chouvy. "All EU 28 countries agreed to seek ways to reduce added sugars intake by10 percent by 2020."
Health campaigns frequently target processed foods and beverages containing added sugars and seek policies and practices to limit their consumption, he says. In addition, current global trends in obesity and chronic disease are creating increased demand for sweetness solutions that have properties similar to sugar, in terms of taste, mouthfeel and volume, but with fewer calories, Chouvy concludes.

As the sugar reduction trend intensifies, sweeteners are expected to continue to be heavily used in reformulations and serve as a more healthful alternative.
By KristianaLalou

Future of food: "Malnutrition is the greatest global challenge," warns FAO

Transformation is needed to provide healthy and sustainable diets for all

11 Jun 2019 Nutrition Insight


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Malnutrition in all its forms is one of the greatest challenges facing the world – as we look toward the future, the food systems of tomorrow must provide healthy and sustainable diets for everyone.

This is the underlying message coming out of the two-day "Future of Food" international symposium in Rome (hosted June 10-11), where key stakeholders are gathering to debate the disparity of why hunger persists in some countries while unprecedented obesity reigns in others.

The increase in diet-related non-communicable diseases is well documented and underscores the urgent need for food system transformation, according to the Food and Agriculture Organization of the UN (FAO). Food and agriculture must move towards the path of sustainability, "achieving more with less and producing safe and nutritious food for all," stresses the FAO.

The "Future of Food" symposium puts the spotlight on vital issues such as how to provide the diets needed for optimal health and wellbeing, while simultaneously addressing issues of social inequality and the depletion of the world's natural resources within the context of climate change. Academics, researchers, policy makers, representatives from civil society and the private sector, parliamentarians and government agencies are attending the final day of the symposium today.

At the gathering, there have been panel discussions on topics including research, knowledge gaps and needs for sustainable food systems and healthy diets; governance of food systems for healthy diets and building consumer confidence in food systems. Questions are also being raised about what it takes to transform food systems.

FAO Director-General José Graziano da Silva opened the symposium yesterday.
Future of Food is the latest global event where the next food frontier takes center stage, a major theme within the nutrition space and the food and beverage industry as a whole.

Last year saw several similar events and reports with one common theme, marking the urgent need for change to better adapt to the projected world population growth. How the industry will feed future generations sustainability and within environmental boundaries remains a looming question.
For instance, last November, an in-depth report from the InterAcademy Partnership (IAP) called for a total transformation of how agricultural systems operate, with consumer choices highlighted as a major factor driving "disastrous climate change." A panel of experts warned that global food systems are failing and urgently need to be turned around to avoid catastrophic climate change.

A key theme focused on how to mitigate impacts through "climate-smart" food systems as well as dietary changes, such as cutting down on meat. The report came as a "wake-up call" to world leaders ahead of the UN Climate Change Conference, COP24, in Poland, which was also held in November.

Changing food systems, sustainability and dietary shifts are all also major topics of interest to leading food industry players. This is evidenced by a swathe of food incubators working with start-ups and companies to find sustainable food and beverage solutions as well as corporate-financed initiatives such as the "Future Food Initiative" where Bühler, Givaudan and Nestlé are collaborating to boost healthy and sustainable innovation.
By Gaynor Selby

Top four dietary supplement trends in New Zealand revealed by national industry organisation

By TingminKoe 20-Jun-2019 –NutraIngredients Asia

Natural Health Products NZ has identified four trendsdriving dietary supplement market growth in the countr, ranging from emerging vitamins and minerals, theAyurveda medicine revival, gut health , and theincorporation of hemp seeds.

Kerry Warn, general manager of Natural Health Products NZ, revealed consumption trends and highlighted some of the country's native ingredients at the 6 nutraceutical industry development conference held in conjunction with HI/FI China tradeshow. The following lists the four key trends that Warn had highlighted:

Vitamins and minerals

Basic supplements such as vitamins continue to drive growth in the market.Vitamin K and A are delivering growth from a small base, while vitamin C is booming primarily due to exports. Minerals supplements saw strong growth led by the popularity of magnesium. On the other hand, calcium isalso a popular choice when combined with at least one additional ingredient to assist with absorption.

Ayurveda medicine renaissance
A representative of Ayurveda ingredient, turmeric has been the "blockbuster botanical" growing at a rapid ratein the country in the past three years, Warn said. Adaptogenic herbs are showing growth despite being a niche area. On the other hand, hemp seeds


Image © iStock.com/AlessandroPhoto

products are likely to be disruptive, due to the ingredient's regulatoryapproval last November. Warn said there were now many products featuring hemp sold in the market.

Importance of digestion to overall health

Probiotics and fibre related products are the popular items to alleviate digestion problems driven by lactose, gluten, and dairy intolerance conditions.As compared to capsules or tablets, dosage format in the form of general food, such as kombucha are thepreferred choice.

Mind, body and soul

There is a move towards fit instead of skinny, and sports nutrition is delivering a better performance inpharmacy, while sales of weight loss products in the same channel is declining. In terms of mind and wellness, supplements that aids sleep are the fastest growing category, while productsthat promote relaxation are also growing. Brain health, despite being a small segment at present, is expected to grow, as the market rides on ongoingtrend in the US.

Other market developments
On the other hand, there is a migration towards naturality and beauty from within products. For instance, there is a shift from OTCs medicines to natural remedies in terms of alleviating cough, cold,digestive problems, and allergies. As with countries from the other parts of the world, collagen products are delivering growth for nutricosmetics sector.

New Zealand and China

New Zealand's export of supplements to China is growing steadily from 2017 till now, following a sudden dropbetween 2016 and 2017. In the first four months of this year, the country had already exported NZD$208m worth of products to China.

Native ingredients

Warn also highlighted some of the interesting local New Zealand ingredients, including horopito, boysenberry, local red grapes, and black currants. For example, the dried leaf and leaf extract from New Zealand native plant horopito were widely used by indigenous Maori people as a painkiller and to alleviate skin problems and diarrhoea. She also pointed out that grapes and black currants that were locally grown contains higher levels of antioxidant phenolics than that of French read grapes and European blackcurrants.

Suntory reveals top five functional beverage trends shaping Japan's market

By TingminKoe 17-Jun-2019
–NutraIngredients Asia

Suntory has identified the top five consumer trends shaping Japan's booming dietary supplement market.


Image © iStock.com/liza5450

The country is witnessing a sharp increase in new product development, largelystemming from regulatory changes. While firms previously had to adhere to the stringent Foods for Special Health Uses (FOSHU) rules, the introduction of the less rigorous Foods with Functional Claims (FFC) in 2015 enabled more innovation.

Against this backdrop, Suntory's open innovation manager, Alexandre Nicolau, revealed five key trends in functional beverages when presenting on the topic "Innovation in Functional Drinks" at THAIFEX – World of Food Asia exhibition heldin Bangkok in late May. Suntory itself is a major FOSHU products innovator. About 50% of Japan's FOSHU beverages come from the firm and most of its products tackle weight management and blood pressure issues.

He said the FOSHU market was worth US$ 6 bn and over US$ 1 bn of this was made up of beverage products. Nicolau pointed out that it usually takes about 24 months for a product to earn the FOSHU status, with an estimatedinvestment of JPY $ 200m to JPY$ 500m. The firm first enjoyed FOSHU success with the launch of its black oolong tea, with sales peaking at US$ 280m in year 2017.

It contains oolong tea polymerised polyphenols (OTPPs) inhibit lipase activity more effectively than green tea, leading to a20% reduction in triglyceride levels in the body.It welcomed another round of success with its Iyemon Tokucha tea, which garnered US$ 500m sales in three years. The tea helps to breakdown stored body fat with quercetin glucoside, a type of polyphenol commonly found in vegetables and fruits such as onions, broccoli, and apples.

At the same time, competitor firms are also gearing up on their innovation and there is a now a trend of launching functional beverages.The following lists the five key trends of functional beverages and related case studies that Nicolau has highlighted:

Weight loss with vinegar
Firms are launching vinegary beverages that reduce visceral fats by making use of the acetic acid component in theproduct.With the rise of such beverages, a new path is paved for vinegar-making firms.Nicolae, however, pointed out that diabetes, not weight management, was the main driver for sales of vinegary drinks inJapan.

Beauty drinks

Typical ingredients used in beauty drinks include Azuki polyphenols, persimmon, collagen, type III collagen, and brown rice black vinegar. Rather than regular bottled beverage, beauty drinks usually come in the form of shots or even beer. An example is Suntory's "All Free Collagen", the world's first non-alcoholic collagen-containing beer targeted at the female market.

Elderly mobility

Maca, royal jelly, and glucosamine are common ingredients found in beverages that promote elderly mobility.The use of protein has not yet reached the same level of importance in Japan as seen in other markets, Nicolau pointed out.

"Strangely in Japan, there is no 'craze' about protein. The development is very slow. This might be because the Japanese' diet ismainly made up of fish, which is heavy in protein," he said. Nonetheless, due to the growing awareness of sarcopenia, he foresees that protein-based supplements will be increasingly common for targeting the elderly.

Gut health

While gut health products have been present in the market for some time, the industry has become "more sophisticated" inthis area."We know that gut health is important, but in terms of functionality, we are just scratching the surface of the microbiome to understand the relationship between all the bacteria and our health and well-being," he said. Nicolae believes there will continue to be new discoveries in this area, given the huge interest in the market in China, the US and European markets.

Sleep and relaxation

Common active ingredients used are GABA, theanine, omithine, and mono-glucosyl hesperin added in chocolate and dairy products. Some product examples include a series of beverages that promote relaxation, sleep and blood flow by Kirin.

Foreign competition

Besides the Japanese firms, established international brands are also vying for a slice of the functional health beverages market.

Some examples include Coca-Cola and more recently, Sprite. Nicolau explained that these brands would usually launch enhanced version of their beverage products to qualify as aFOSHU product. “They have an advantage, because consumers already know them and have found a connection to these brands.” Despite the usefulness of branding, he stressed that the science of products remained “the core of trust” in Japan.

Matcha made in heaven: Cookie format a possible alternative to green tea for reducing stress — Japanese RCT

By Cheryl Tay 10-Jun-2019
–NutraIngredients Asia

Consuming matcha in some form may have stress-reducing effects even on people who do not drink green tea, according toa Japanese study that used matcha cookies as its intervention.

While both animal studies and human clinical trials have reported that matcha, a powdered green tea, possesses stress reduction properties, the impact of matcha when added to confectioneries is unclear.Researchers at the University of Shizuoka conducted a double-blind RCT to assess stress-reducing effect of matcha incookies consumed by human study subjects.

Matcha matching

They recruited 36 healthy pharmacy students aged 23 to 24 years old (18 male and 18 female) from among the fifth-year college population of the university. Throughout the study period, the participants — all non-smokers who were not on regular medication, and who had no acute or chronic diseases — were instructed not to consume theanine - or caffeine-rich beverages such as coffee, greenand black tea, and soda, or caffeine-rich chocolate or candy. While they were permitted to drink water and barley tea whenever they pleased, alcohol consumption in the evenings was strictly forbidden. The researchers randomly divided them into two groups: 19 subjects in the test-matcha group and 17 subjects in the placebo-matcha group. Each participant had three cookies (containing a total of 4.5g of matcha) a day, and none of themknew if they were consuming test or placebo matcha.

This period lasted for 15 days, starting seven days before the participants were assigned to a practice outside the university, either at a hospital or a pharmacy. They were required to complete a questionnaire at the end of each day's practice, including feedback on their physical condition, subjective stress, and achievement emotion.

Stress and suppression

The researchers then analysed their seven days of routine university life and first eight days of the pharmacy practiceprogramme,examining their state of anxiety before the practice started and on the eighth day of the practice. They subsequently observed that salivary α-amylase activity, a stress marker, was significantly lower in the test-matcha group than in the placebo group. This indicated that the caffeine and epigallo-catechin gallate (EGCG) to theanine and arginine (CE/TA) ratio of tea components was "a key indicator for the suppression of stress" .

Furthermore, matcha with a CE/TA ratio of 2 or lower displayed a stress reduction effect, even when consumed in the formof a confectionery product, meaning it could benefit those who did not drink green tea. While the reason behind why a CE/TA ratio of 2 or lower was necessary to significantly suppress stress was not clear, the researchers wrote: "Theanine has been reported to inhibit the excitatory effects of caffeine. In addition, arginine is considered to be an important regulator in the central nervous system through the synthesis of nitric oxide.If the CE/TA molar ratio of matcha in confectionery products is 2 or less, then the stress-reducing effect of matcha is not disrupted by caffeine and EGCG."

In conclusion, they wrote: "Matcha, which has a stress-reducing effect, contains less caffeine and EGCG than twice the molaramount of theanine and arginine."Even when matcha is included in confectionery products, a stress-reducing effect was observed. Daily intake of matcha with a lowCE/TA molar ratio in confectioneries may benefit people who do not drink green tea, and serve as a simple and practical way to prevent the accumulation of stress.”


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REGULATORY NEWS

Molecular electronic device detects E. coli

IFT Next Newsletter June18, 2019

Detecting specific strains of bacteria that cause food poisoning quickly is important to food safety. Current methods can be either time-consuming or expensive.

Now, a team of electrical engineers from the United States and Turkey have developed a fast and inexpensive technology to detect and identify specific strains of bacteria like E. coli. Their study is published in Nature Nanotechnology.

The technology involves adapting a molecular electronic device called a single-molecule break junction to detect RNA from strains of E. colithat cause illness. It uses atomically fine electrodes to suspend a DNA probe that binds target RNA, according to the research. This device can detect as little as a one-base change in RNA, which is enough to not only determine that the bacteria strain was E. coli, but that it was the strain that produces Shiga toxin. "We believe that this approach can be further developed to make an electrically based sensor for diagnostic purposes," write the researchers.

FDA announces new qualified health claims for omega-3s and heart disease

IFT Weekly June 2019

The U.S. Food and Drug Administration (FDA) has announced that it does not intend to object to the use of certain qualified health claims stating that consuming eicosapentaenoic acid (EPA) and docosahexaenoic (DHA) omega-3 fatty acids in food or dietary supplements may reduce the risk of hypertension and coronary heart disease.

Specifically, the FDA responded to a health claim petition submitted by The Global Organization for EPA and DHA Omega-3s in a letter of enforcement discretion. Enforcement discretion means that FDA does not intend to object to the claim if it is used consistent with the factors described in the letter of enforcement discretion.


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The FDA determined that the overall evidence did not meet the "significant scientific agreement" standard required for an authorized health claim but did meet the "credible evidence" standard for a qualified health claim in the labeling of conventional foods and dietary supplements.

The agency found that while there is some credible evidence suggesting that combined intake of EPA and DHA from conventional foods and dietary supplements may reduce the risk of hypertension by lowering blood pressure, this evidence is inconclusive and highly inconsistent. EPA and DHA omega-3 fatty acids are found primarily in some fatty fish, fish oils, and dietary supplements.

The FDA thoroughly reviewed the 717 publications cited by the petitioner. The FDA also considered other written data and information, including studies published after the petition was submitted and studies cited in public comments about the petition. The FDA posted the petition for comment and received 22 comments in response to the petition.

Under FDA's health claim regulations, foods and dietary supplements that bear a health claim must meet requirements regarding levels of certain nutrients. These requirements and the enforcement discretion factors the FDA intends to consider for the use of this qualified health claim are described in detail in the letter of enforcement discretion issued to the petitioner. One of these enforcement discretion factors is that dietary supplements and conventional foods labeled with the qualified health claim contain at least 0.8 g EPA and DHA (combined total) per serving.

To prevent consumer deception about the strength of the science underlying the new claim, the qualified health claim must be accompanied by a disclaimer or other qualifying language that accurately describes the level of scientific evidence supporting the claim.

Cheap, dangerous oil: Indian FDA warning over adulterated products amid FSSAI rule change

By Pearly Neo 17-Jun-2019 –Food Navigator Asia

The Tamil Nadu Food Safety and Drug Administration Department has warned the Indian public about the continued dangers of adulterated edible oil despite a recent labeling change made by the Food Safety and Standards Authority of India (FSSAI).

The state government food safety agency conducted a raid on a local oil mill earlier this year, and issued the warning after it discovered that higher-priced oils from sesame and groundnut were being adulterated with palm oil.

"We found that palm oil was being mixed with sesame oil and groundnut oil, [and unaware consumers were purchasing these because of the cheap price," said Tamil Nadu Food Safety and Drug Adminstration Department Designated Officer Dr R. Chithra to Times of India."It is important to obtain oils from reputed mills and avoid these adulterated products, as palm oil can cause health complications, especially heart-related ones."

The adulterated oils could contain up to 70% palm oil content, to which an unidentified essence would be added so as to give the desired flavour or aroma. In addition, the agency added that multiple loopholes were available in current legislation, which oil traders were making full use of. Examples included printing small-font printing mentioning palm oil on the label, as well as avoiding mention of the oil blend ratios.

This comes on the heels of FSSAI having announced a change to edible oil labelling back in December last year, specifying that every package containing oil blends needs to display a label stating 'Blended Edible Vegetable Oil' on the pack, as well as the name and nature of the oils. The specific percentages of each oil by weight also need to be declared.

"The font size of the declaration 'Blended Edible Vegetable Oil' shall not be less than 5 mm, and the font size of the other information shall not be less than 3mm," said FSSAI CEO Pawan Agarwal in an official statement."For edible oil in packages weighing five litres and more, the font size of the 'Blended Edible Vegetable Oil' declaration shall not be less than 10mm."

The regulation is set to be enforced come July 1 this year. A transition period of some six months was given to oil companies since the change was first officially announced. Given the recent adulteration findings and FSSAI's recent slew of regulatory implementation delays, it remains to be seen whether the quality and safety of edible oil in the country can be more guaranteed come July 1.

Edible oil adulteration checking device

FSSAI also recently announced that it had official certified the Raman-1 spectrometer for the testing of edible oil adulteration 'after a long and rigorous validation process'. The Raman-1 is a chalkboard duster sized device that uses micro-optics, mobile and cloud technology, artificial intelligence and machine learning to take adulteration testing for oils out of the lab. According to the official release, the device can be used to scan through any transparent packaging without having to open it, and test results are instantly displayed on a mobile app.

"We have tested 20 different types of oils and over 90 different brands. All non-compliant samples identified were sent for laboratory testing, and in all cases, our system results were confirmed," said Deepak Mehrotra, CEO of Oak Analytics which developed the Raman-1."Our system is not intended to replace laboratory testing, but is meant to be an inexpensive and quick supplement to existing quality assurance practices."

The device is currently being tested by the Delhi, Chandigarh and Kerala state food safety authorities, and there are plans to roll out to more states in the future.

Infant formula in India: FSSAI proposes regulations for products with special medical purposes

By Cheryl Tay 30-May-2019
–NutraIngredients Asia

The Food Safety and Standards Authority of India (FSSAI) has issued a notification on a draft regulation for infant nutrition safety standards, calling for industry stakeholders to submit their comments.

The draft details more comprehensive regulatory measures as an update to the existing 2011 regulations, covering standards for infant formula for special medical purposes, particularly food for infants with inborn errors of metabolism (IEM).

While most nutritional products for infants with IEM are imported into India, the FSSAI's proposed regulatory changes would make it possible for such products to be manufactured locally. The proposed standards contain detailed requirements that specify the scope, composition, and food additives for each of the following categories:

- Infant milk food
- Infant formula
- Milk cereal-based complementary food
- Processed cereal-based complementary food
- Follow-up formula
- Infant formula for special medical purposes
- Premature infant milk substitute
- Lactose-free and / or sucrose-free infant milk substitutes
- Hypoallergenic infant milk substitutes
- Foods for infants with IEM
- Food for infants based on traditional food ingredients

Standards and exemptions

In the draft, the FSSAI stated that while foods for infant nutrition must be packed in "hermetically sealed, clean, and sound containers or in flexible packs made from paper, polymer, and / or metallic film", infant formula for special medical purposes "shall be exempted" from provisions specified under the same regulations.

The regulatory body went on to state that the categories 'infant formula for special medical purposes' and 'food for infants based on traditional food ingredients' "shall conform to the microbiological standards for milk and milk products in the category of infant formula" .

It also laid out standards for ingredient sources, saying that foods for infant nutrition may contain algal and fungal oil as sources of DHA and ARA — with Crypthecodinium cohnii, Mortierella alpina, Schizochytrium sp., and Ulkenia sp. among the approved sources — at a maximum level of 0.5% DHA of total fatty acids, and a minimum 1:1 ratio of ARA to DHA.
The FSSAI added that this was "provided that DHA content shall not be less than 0.2% of total fatty acids, if a claim related to the addition of DHA is made" , and that infant milk substitutes for premature infants contain not less than 0.2% DHA of total fatty acids and a minimum 1:1 ratio of ARA to DHA.

It further said: "No person shall manufacture, sell, store, or exhibit for sale infant milk food, infant formula, milk cereal-based complementary food, processed cereal-based complementary food, and follow-up formula, except under the Bureau of Indian Standards (BIS) certification mark."

Once again, the infant formula for special medical purposes category as specified by the draft regulations is exempt from this provision.

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Other concerns

In light of concerns that companies have been exploiting regulatory loopholes to market baby food — an activity banned under the Infant Milk Substitutes, Feeding Bottles and Infant Foods (Regulation of Production, Supply and Distribution) Actor IMS Act — the FSSAI also included a standard specifically targeting such activity. It stated: "Food for infant nutrition, except in the category of special medical purposes, shall also comply with the requirements of the IMS Act 1992."

Plastic in India: FSSAI ordered to assess need for further regulations restricting food packaging

By Pearly Neo 25-Jun-2019 –Food Navigator Asia

The Food Safety and Standards Authority of India (FSSAI)has been ordered to head up a committee examining the necessity of establishing further regulations governing the use of plastic packaging for food products in the country.

The agency was tasked with this by India's National Green Tribunal (NGT), with a bench headed by NGT chairperson Justice Adarsh Kumar Goel, and comprising representatives from FSSAI, the Bureau of Indian Standards, the Central Pollution Control Board, and the Directorate General of Health Services.

"The nodal agency for coordination will be the FSSAI. The committee will be at liberty to co-opt any other expert/institute or individual and furnish its report to this tribunal within three months by e-mail," said NGT in the official order document on LiveLaw.

The bench issued this order after hearing a petition filed by non-governmental organization (NGO) Him Jagriti Uttaranchal Welfare Society, which was seeking a ban on use of plastic bottles and multi-layered plastic packages for food and beverage items. According to the NGO, these packages were harmful to human health in the long run, especially due to chemical leaching.

"The regulations governing the use of plastic packaging are inadequate firstly because there is no specific testing protocol for the specific migration testing of antimony and plasticizer compound di-2-ethylhexyl phthalate (DEHP),"said the NGO."In addition, the current rules for plastic waste] are limited for restrictions of plastic 'bags' only. It does not cover plastic packaging in-depth, especially PET bottles."

The order further said that the Ministry of Environment, Forests and Climate Change (MoEF&CC) had also found the current plastic waste regulations to be 'deficient'. "In all, the Packaging and Labelling Regulations, 2018 under the Food Safety and Standards Act, 2006 do not deal with the issue in entirety and are not adequate to deal with the problem," stated the order. The next hearing for the matter has been set for October 14 2019.

India's Packaging and Labelling Regulations, 2018

The country's Packaging and Labelling Regulations, 2018 were announced earlier in January this year. According to the official FSSAI statement on the matter, the regulations will cover general and specific packaging material requirements as well as overall migration and specific migration limits of contaminants for plastic packaging materials.

"The packaging materials used for packing or storing the food products shall conform to the Indian Standards provided in the schedules," it added.

According to the National Law review: "These standards refer to the Indian Standards (IS) listed in Schedules I, II, and III that apply for paper and paperboard materials, metal and metal alloys, and plastic materials, respectively ."

Basically, the gist of the regulations says that 'unsafe' materials such as newspapers and recycled plastics may not be used to wrap food. The date of enforcement for this has been set for July 1 2019, but given FSSAI's recent multitude of delays in new regulatory implementation, it remains to be seen whether this will come to pass on the expected date.


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