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PFNDAI Bulletin

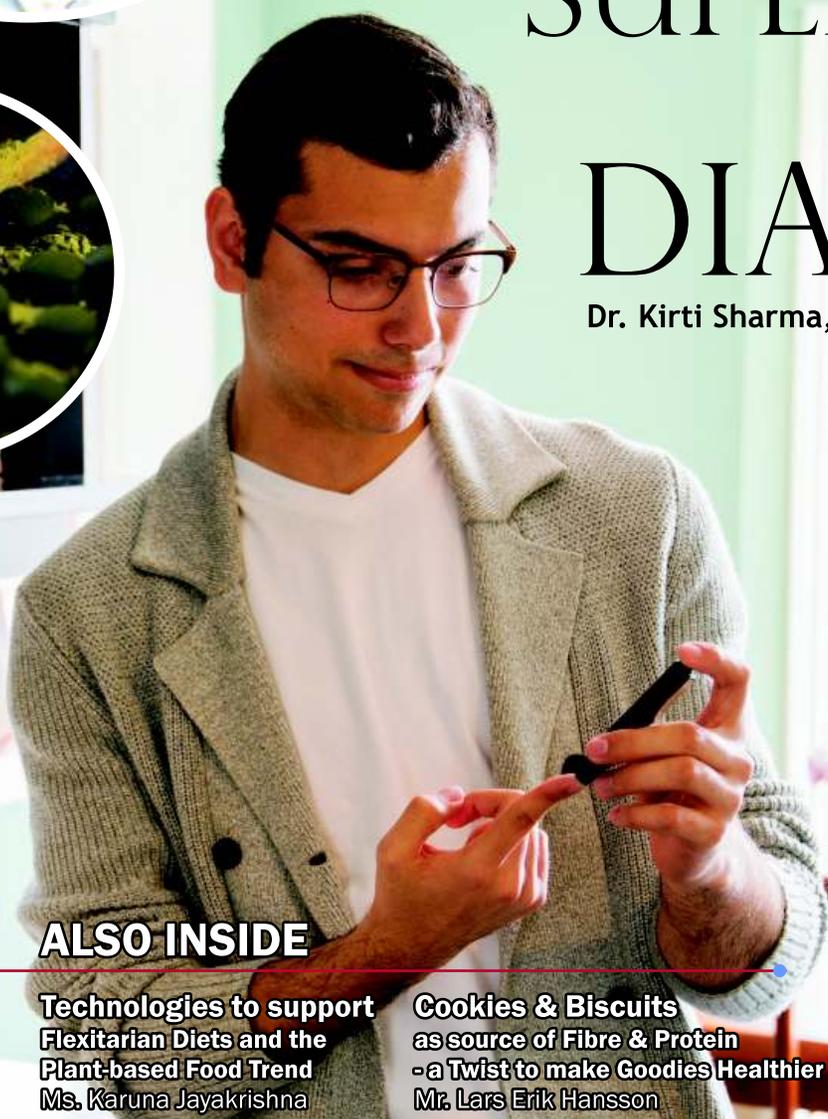
FEB 2020

FOOD, NUTRITION & SAFETY MAGAZINE



SUPERFOODS FOR DIABETICS

Dr. Kirti Sharma, Ms. Afreen Sultana & Ms. Deepika



ALSO INSIDE

Technologies to support Flexitarian Diets and the Plant-based Food Trend
Ms. Karuna Jayakrishna

Cookies & Biscuits as source of Fibre & Protein - a Twist to make Goodies Healthier
Mr. Lars Erik Hansson

Report on PFNDAI Merit-Cum-Means Scholarships
Ms Anuja Rawool

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EDITORIAL

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Regulatory agency recently notified several regulations controlling advertising and claims made by companies marketing food products. These are meant to protect and educate the consumers so they can make an informed choice. The claims should not be misleading making consumers believe the product to be something when it is not.

Yes, it is very important to protect the consumers from false claims and misleading advertisements. However, when you make the rules so rigorous then even the genuine claims are not made for the fear of reprisal especially of a very rigid system which allows safety officers also to initiate action.

Why not have no claims and why not have advertisements only after authorisation by regulators? I am sure our regulator with all the luminaries at their disposal, can come up with a system where they will devise some statements and only those will be placed on labels or advertisements when certain conditions which regulator has devised are met. So marketer simply checks some boxes and those statements will appear on labels and promotional materials.

In some countries of eastern block, they did not allow brands, claims, or any promotional statements. Each product was supposed to be as per the government standards. So one simply bought bread, biscuit or juice with no descriptor except the generic name of the product.

People always preferred to have choice and so they would like to know what is the specialty of any product if any. That is why so many different brands and variations of bread came up. In that also there are some products had different composition, method of preparation, taste, colour,

appearance and texture. Each individual would like to have some preference and would like to know what is the difference.

Every manufacturer has to provide certain mandatory information about nutrition, ingredients, best before date etc. That may or may not help him sell as people do not spend much time reading that. So he makes claims or advertises emphasising advantages in order to sell the product.

Although nutrition awareness can and must partly come from manufacturer or marketer of food products, they are not the sole responsible people doing this. Their major role is to make and sell products. Product should be safe and nutritious and of high quality.

Providing awareness is government's responsibility and we feel that very little is being done. Regulator can't just make rules and punish those who break them. They should also try to create awareness about nutrition, safety and planning a healthy diet etc.

The video prepared some time ago was excellent but efforts should not stop there. They should be continuous. Just putting some posters on website and on social media is not enough. They should go to schools, colleges and workplaces as well as reach people through regular media such as TV, radio and print. Instead of scientists and educators speaking about this we only see administrators talking. We hope things change and we see more happening in creating awareness in future.

Prof Jagadish Pai,
Executive Director,
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SUPERFOODS FOR DIABETICS

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With the digital revolution changing the way every single interaction is undertaken, including the food purchase and consumption patterns, it is not surprising to see its impact on the innovation & renovation cycle of consumer- led, nutrition- based, novel foods products.

Innovations that have taken place in the past few years wherein newer technologies have also played a significant role in launching products that never existed before. At the same time, consumers around the world are trying to find their roots back to traditional foods. One such rediscovery of Earth's true health food is "Superfoods".

David Wolfe, the author of Superfoods: The Food and Medicine of the Future defined Superfoods as a combination of both medicine and food. They are a class of most potent, super concentrated, nutrient-rich foods on the planet having a major focal point of nutrition because they help nourish the body and also help to guide us towards a more natural and aboriginal diet.

There are several superfoods like cacao, spirulina, maca, aloe vera etc., that are gaining importance to improve the severity and symptoms of various disease conditions like insomnia, cancer, high blood pressure, diabetes, heart disease, poor immunity etc., At the same time, many research findings reveal

the beneficial properties of conventional foods such as tea, blueberries, pomegranate, millets and other foods which are also collectively called as "superfoods". While talking about diseases, the most prevalent and common disease that affects around 8.5% adult people globally is Diabetes. In India, it is estimated that 73 million adults are affected by diabetes. Diabetes is a chronic non- communicable disease that occurs when there is a lack of insulin that results in the rise of blood glucose levels. This, in turn, leads to damage to the body and failure of various organs and tissues. There are two types of diabetes namely insulin dependent (Type-I) and insulin independent (Type-II).

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52%
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PROTEIN



SOYA DAHI VADA



SOYA PASTA



SOYA FRIED RICE



SOYA NOODLES



SOYA CURRY



SOYA KAJU MUTTER

DELICIOUS SOYA CUISINES TO DEFEAT PROTEIN DEFICIENCY

A recent survey* suggests that 73% of the Indian diets are protein-deficient. Part of the reason lies in the insufficiency of protein content in conventional protein sources like eggs, lentils, milk, etc. We at Ruchi Soya, the makers of Nutrela Soya Chunks, Mini Chunks, and Soya Granules help consumers bridge this gap by providing '52% Dhaakad Protein', that can be used to cook delicious cuisines to tickle everyone's taste buds, from breakfast to dinner, at the most affordable price.

Let's join hands to include soya enriched dishes in our daily meals, and help India register a delicious victory over protein deficiency.

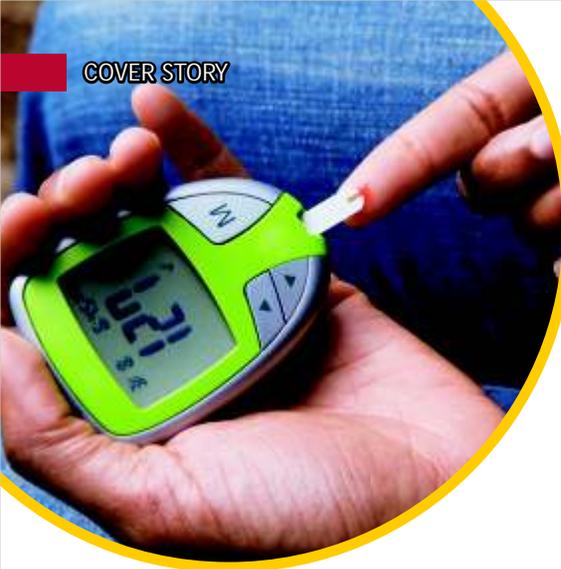
200 gm NUTRELA SOYA	15 BOWLS OF COOKED DAAL	
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Whichever the diabetes type might be, in order to keep it in control, a proper diet, managing the daily activities along with the medications depending on the severity needs to be maintained. Whereas modifications in both quantity and quality of food consumed helps in the dietary management of the disease. Diabetes, when not taken proper care, might end up in complications such as cardiovascular disease, kidney disease, nerve damage, reduced vision and even pregnancy complications affecting both the mother and the foetus. Thus, it is important to maintain a proper diet with adequate nutrients to help manage diabetes and prevent its complications.

Nutritional guidelines for diabetes

1. Diabetic patients should avoid fasting and feasting.
2. The recommended calorie intake depends on the person's physical activity and is 10 percent lesser for person above the age 50.
3. The minimum amount of carbohydrates should be 130g is given to prevent ketosis and it should come from a mix of (resistant) starches and fibres (both soluble & insoluble).
4. For diabetic patients taking insulin, regulating of meals is needed where meals should be spaced to consider the availability of insulin.
5. The overall diet should meet the requirements of antioxidants, micronutrients and phytochemicals, the intake of permitted vegetables and fruits

should be increased.

6. Thus the nutritional requirements for diabetic patients are different when compared to normal people. A diet which includes low glycaemic foods, low fat and high protein with balanced intake of dietary fibre, vitamins and minerals as a routine would be recommended for diabetic patients.

Carbohydrates: 55-60 percent of carbohydrates should be consumed as a part of balanced diet. Complex carbohydrates and fibre should be included in the diet. 25-40 g of dietary fibre can be included per 1000kcal consumed. Foods with high glycaemic index should be consumed less and in accordance to the dietary guidelines for diabetes. Both the source (GI) and quantity (Glycaemic load) of carbohydrate influence the metabolic response to the ingestion of carbohydrate. Thus maintaining both the type and amount of carbohydrate in meals is important to maintain normal blood glucose levels.

Fat: People with diabetic condition should consume a low fat diet, as intake of high fat increases LDL and VLDL levels. Thus a low fat diet of about 20-25 percent of total calories including more of polyunsaturated fatty acids than saturated fat would be recommended. Good fats such as Omega-3 rich foods should be added to the diet.

Protein: High protein intake helps to compensate the defect in glucose mediated insulin secretion since the amino acids present in the protein stimulates insulin secretion and it also promotes satiety. Hence 10-15

% of total intake of protein is beneficial for diabetic patients.

Dietary fibre: 20-30 g of soluble fibre can be beneficial for diabetic patients as soluble fibres such as pectin, hemicellulose delay gastric emptying by increasing the transit time thus glucose absorption slows down. Whereas insoluble fibre works by increasing the transit time, delay glucose absorption and slows down starch hydrolysis. Hence dietary fibre improves glucose metabolism without increasing insulin secretion and are considered beneficial for diabetic patients.

Super Foods for Diabetics

The importance of nutrition for diabetes management is well established. As people are now looking forward to traditional, organic and natural foods rather than medications and supplements, 'Superfoods' has become a rising interest of topic.

Some of the superfoods for diabetics are:

1. Millets

Millets are important cereal crops for dry land regions, they seemed to have been forgotten in the past decade, but have recently started gaining attention among people as alternate ingredient for 'gluten free' foods and for various potential health benefits.

The beneficial effects of millets for diabetes have been noted through various researches. Millet protein increases insulin sensitivity and lowers blood glucose level. Finger millet/Ragi has proven to have reverse effects on hypercholesterolemia and hypertriglycerolemia associated with diabetes. Foxtail millet helps improve glycemic control among type 2 diabetic patients. Millets are now commercially available in many forms and can be a part of your diet by including them in foods such as dosa, idli, khichdi, porridge, roti etc.



2. Legumes

Legumes such as beans are packed with proteins and are relatively high in fiber. They also belong to low GI foods category and therefore facilitate slow release of carbohydrate. They have proven to be beneficial to diabetics by having positive effects of reducing HbA1C and blood glucose levels, when consumed over a period of time as a part of balanced diet. Legumes have always been a part of traditional Indian diet in the form of dals and cooked vegetables (sabji). Other ways to incorporate them in your diet can be in the form of boiled chana, chickpeas etc. and consumed as part of your snacks and salads.



3. Flax seeds

Flax seed in either whole, oil or gum form is beneficial for diabetes, as it is a very good source of omega 3 fatty acid and fiber. The main constituents of flax seed include its

mucilage (6%), insoluble fibres (18%), proteins (25%), and oils (30-40%) with -linolenic acid (50-60% of oils) being the primary fatty acid and lignans. It has proven to be effective in lowering blood glucose levels by reducing the carbohydrate absorption from the gut. The presence of omega 3 fatty acids and dietary fibre also help reduce blood cholesterol, as the flaxseed mucilage changes into short chain fatty acids in the intestine and reduces the synthesis of liver cholesterol and thus helps reduce diabetes risks. 5-10g of roasted flax seeds can be consumed daily as a part of healthy snack, or can be mixed in low-fat yogurts, salads and curries.

4. Yogurt Dairy consumption



in general has many health benefits and fermented dairy product such as yogurt asserts added advantages due to the probiotic nature. A meta-analysis study has reviewed that consumption of probiotics reduced HbA1C levels. One study has shown that consumption of probiotic yogurt had positively decreased fasting blood sugar. Yogurt consumption has been associated with improved insulin resistance. As a nutrition perspective it is recommended that for diabetes mellitus low fat dairy should be consumed.

Low fat yogurt can be consumed daily as such or in the form of smoothies.

5. Berries

Along with bringing colors to plate and good taste, berries are nutritious as they are packed with antioxidants and polyphenols such as flavonoids and anthocyanin's. Extracts of bilberry and black currant have shown to have the potential to improve insulin sensitivity. It has been found that intake of blueberry is associated with reduction in the risk of type 2 diabetes. Berry intake supports the growth of favorable mucin producing bacteria that can protect the lining of the gastrointestinal tract, which may mitigate lower intestinal and systemic inflammation and improve metabolic outcomes. The anti-diabetic activity of the berry polyphenolics may be due to their antioxidant, anti-inflammatory, carbohydrate digesting enzyme inhibition and absorption in the gastrointestinal tract. Berries can be mixed along with yogurt and

consumed as smoothies or can be eaten along with nuts and seeds as a mid - morning or afternoon snack. It can also be added to your breakfast cereals.



6. Walnuts

Walnuts are good source of antioxidants and omega 3 fatty acids. The antioxidant property of walnuts is comparatively higher than other nuts, and has proven to be beneficial to diabetics by reducing the level of oxidative stress, as stress is known to initiate and progress Type 2 Diabetes. This beneficial property of walnuts helps in diabetes management. Walnut oil has been proven to improve levels of Fasting blood glucose and HbA1C, it also improves glucose homeostasis. Goodness of walnuts can be incorporated in your diet by consuming 3-4 kernels added in breakfast cereals or by mixing it with seeds and other nuts as a part of your healthy snack.



7. Fenugreek

Fenugreek is a well-known condiment; it is used in many cuisines for its taste. For its beneficial properties it has been a part of many ayurvedic medicines. Fenugreek is a good source of fiber and helps manage diabetes by reducing blood sugar levels. Antihyperglycemic effect of fenugreek fibre is attributed to its ability to retard lipid and carbohydrate digestion and absorption from gut by inhibiting lipid and carbohydrate hydrolyzing enzymes. Dry or fresh fenugreek leaves can be consumed daily by incorporating it in curries or fenugreek seeds can be consumed by infusing it in water or other beverages. The powdered form can be incorporated in preparations such as chapati, rice dal and vegetables.



8. Spirulina Spirulina is a concentrated source of functional nutrients.



It contains more than 60% digestible proteins and is also loaded with phytonutrients such as β -carotene, essential fatty acid such as ω -3 linolenic acid and trace minerals. Spirulina has been emerged as a therapeutic food for diabetes management. Human clinical studies of spirulina supplementation have shown significant reduction in HbA_{1c}, indicating improved long term glucose regulation. Anti-diabetic effect of spirulina may be due to both protein and amino acid ingestion which stimulates insulin secretion. Spirulina can be a part of your diet by adding it in your smoothies or by mixing the dry form of it in salads and soups.

9. Ginger

Ginger is a commonly used spice

known for its anti-oxidant and anti-inflammatory properties. It is widely used in ancient medical practice for treatment of gastrointestinal disorders. Phytochemicals present in ginger include gingerol, shogaol, zingerone and β -bisabolene. Along with these biological compounds ginger also contains vitamins (B and C) and minerals (calcium, magnesium, potassium and phosphorus). Ginger's phenolic compounds (gingerol and shogaol) have inhibitory properties for α -amylase and α -glucosidase enzymes, which are associated with carbohydrate metabolism and hence hyperglycemia. Ginger also stimulates insulin secretion in pancreatic β -cells and thereby helps in diabetes management. Ginger can be added in tea, curry and stir fried

vegetables, ginger infused water can also be a part of your diet.

Diabetics have specific needs and their food is as critical as the medicines they eat. Being an irreversible lifestyle disease, it is extremely essential for the people with diabetes to change their food habits in a way that helps them manage their condition better. In addition to all the therapeutic/medicinal ways of managing diabetes, the initial researches are indicating towards a positive role of superfoods (as a part of balanced diet and an active lifestyle) in improving the quality of life of the people with diabetes. Hence, a more structured and scientific research should be undertaken in this area.

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- Fruits, vegetables and its products
- Cereals, pulses and its products
- Spices, Condiments and its products
- Animal origin, fishery and its products
- Alcoholic and non alcoholic products
- Oil seed, oils and its products
- Sweets, confectionary and its products
- Bakery products
- Sugar, Honey & jaggery
- Process, canned food products
- Feeds
- Water
- Ready to eat
- Infant substitute
- Skim Milk Powder

Testing as per FSSAI requirements.

- Pesticide residues, PAH, PCB's
- Mycotoxins
- Naturally occurring toxins(NOT,s)
- Heavy metals and minerals
- Minerals & Toxic heavy metals
- Vitamins
- Antibiotics / Residues
- Food Adulteration tests
- Food additives, preservatives and artificial sweetners
- Synthetic food colour
- Antioxidants
- Packaged Drinking analysis as per IS 14543
- Drinking water as per IS 10500
- Process water IS 4251
- Shelf life study(Ambient @ Accelerated)
- Microbiological testing (Bacterial and pathogens)
- Hygiene audit /Kitchen audit
- Allergens
- Sterol Composition



Analytical Facility

- | | |
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TECHNOLOGIES TO SUPPORT FLEXITARIAN DIETS AND THE PLANT-BASED FOOD TREND

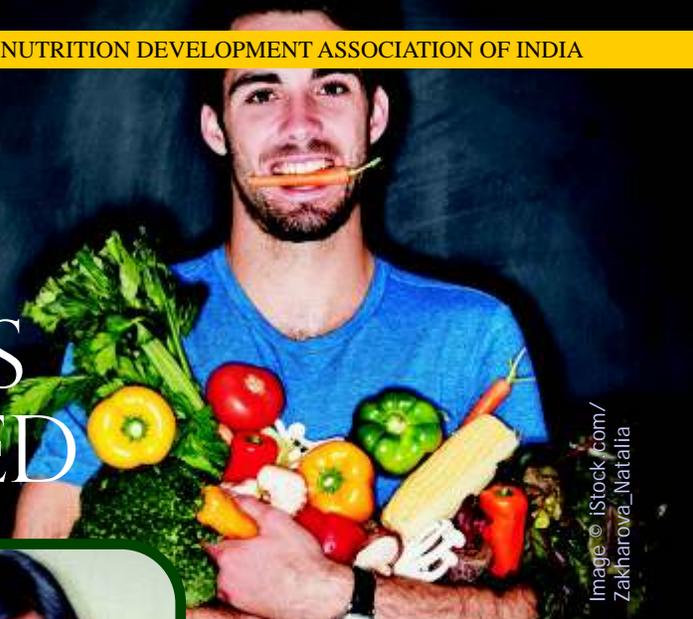


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AUTHOR
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 South Asia

Many consumers want to increase their intake of fruits, vegetables, grains and other plants. In fact, there is growing interest in consuming more plant-based products. What's attracting consumers to plant-based foods?

There are three main drivers—health, sustainability and the increasing variety of options. Consumers perceive plant-based foods to be better for their health and better for the environment. While the Plant-based meat category has historically appealed to strict vegans and vegetarians, a new consumer is emerging – the ‘flexitarian.’ Flexitarians eat meat but are also purposefully including more plant-based meals in their daily diets. Today, the plant-based meat market is fuelled by the growing number of flexitarians. In the same category, the growing number of innovative products is also contributing to greater consumer interest and trial. The consumer has different expectations than the traditional vegetarian or vegan consumer. DuPont’s Consumer Behavior Analysis for Plant-based meat products conducted in 2019 reveal that, today’s flexitarians are all about the eating experience; when considering plant-based meats, they seek real meat-like taste and texture and want

options that align with their health and sustainability goals.

Packing in the health benefits along with right taste, texture, and stability, while also avoiding inevitable challenges isn’t easy- but, with the right expertise and ingredients, it is possible. Brands can create innovative formats that capture the most discerning flexitarian, vegetarian or vegan consumer.

One product that stands out is Soy Protein; as a plant-based source of protein. Soy proteins are among the most versatile in food and beverage applications. They provide nutrition value and structure in a variety of meat-free applications. Soy proteins as a solution for plant-based meat come in a variety of formats – textured and powdered. These formats are often used synergistically to deliver meat-like texture and fibrosity. They can be creatively combined to mimic

chicken, pork or seafood, and because they are bland in flavor, can be easily flavored to deliver a meat-like taste and textural experience.

Soy Proteins are more environmentally friendly and sustainable than meat and dairy proteins. A third-party review and validated Life Cycle Assessment (LCA) of DuPont soy protein operations, validates that the carbon footprint of its soy protein products is anywhere from 8-80 times lower than analyzed meat and dairy proteins. Manufacturers have leveraged this data to support their internal and brand goals and messaging supporting their commitment to sustainability through ingredient sourcing practices.

Globally, Soy protein is associated with many of the largest and most successful brands in the plant-based meat category. According to Innova Market Insights, over the last 3 years (June 2015-June 2018), 4,325 plant-based meat products were introduced into the global marketplace. Of those 1,020 contained soy protein – or 23.5%. The next most used protein source was wheat found in at 579 or 13.3% of total launches. Pea protein was third with 249 launches, or 5.7% of total launches. Soy protein remains the most widely used protein in the

¹ Health Focus International, “Plant-Based Eating International Syndicated Study”, August 2017
² Innova, “Category Insider – Meat Alternatives – Global”, November 2019.

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category in innovation, either as the sole protein source, or combined with others such as wheat or

pea protein.

Most commercially viable plant-based proteins are lacking in one or more of the essential amino acids, making them lower in protein quality. However, Soy protein has been studied extensively in clinical research – demonstrating efficacy for heart health, weight management, muscle health and healthy growth and development in children. Today, there are over 400 published studies specifically involving DuPont’s soy protein products and supporting these benefit areas.

In addition, Soy protein has an approved health claim in 13 countries supporting its benefits in reducing cardiovascular disease risk. The amount of clinical research supporting the quality and health benefits of soy protein far outweighs evidence supporting specific benefits of any other plant-based source.

Manufacturers of plant-based meat products need effective egg alternatives that will help them optimize costs while continuing to create high quality consumer products. There are standardized solutions available in marketplaces which help to improve texture, bite, structure and mouthfeel of reformed and emulsified vegetarian options at the same time offering a cost-effective solution to egg replacement. These stabilizer systems with characteristics like that of egg white are easy to use and can be added directly into the mix what makes both formulation and production process easier and less expensive.

Dairy milk alternatives are another emerging category and consumers’ desire to avoid the digestive discomfort they associate with cows’ milk has been one of the key drivers of growth for plant-based beverages. Environmental concerns and wanting to increase plant-based foods consumption are drivers among selected consumer groups. It is a growing category with more variety and choice for the consumer. Choice is coming from the diversity of the plant base sources like almond, coconut, soy etc. and from the different types of products available on the shelf.

Plant-based innovations are becoming mainstream and for a green transformation it is important to have the best performing ingredients. Since 2014 the number of new products positioned as vegan Beverages as one of the top categories. For instance, as brands pack more protein into their foods to meet growing consumer demand, highly effective stabilizer systems are needed to stabilize the protein and deliver the right texture.

Plant-based proteins, like soy and pea, are growing in use across applications, but they behave and taste different than dairy proteins. Soymilk is the major plant-based milk alternative category as well as almond milk. Working with plant proteins brings different challenges and opportunities in terms of mouthfeel & taste, hydration & viscosity, foaming, solubility, emulsification etc. Though plant-based dairy alternatives do not require added plant proteins, several companies do so for functionality, to mimic nutrition of actual dairy and to cater to active nutrition consumers.

A similar challenge can occur in fermented products, such as yogurt-like snacks, which suffer from extended fermentation time, grainy

and thin textures, as well as bland taste. Cultures for yogurt alternatives and other plant-based foods & beverages have been developed for a wide-ranging variety of plant-based raw materials, such as soy, coconut, nuts, oat, maize, rice, fruits and vegetables, to satisfy consumer taste and texture expectations from fresh, clean and mild flavors through to acidic profiles.

When formulating for these applications, it’s crucial to understand how the ingredients work together, otherwise you sacrifice losing something in either the nutritional benefits or the food experience

(As some of these dairy-free, plant-based beverages and fermented snack examples prove, our approach to consumer insights, our broad portfolio and our passion to solve helps us offer a total solution for food and beverage manufactures looking to appeal to new consumers.) We’re on a constant quest to look at what’s new, continuing to innovate our methods, including exploring how sensory experiences are linked to the parts of the human brain that deliver emotions.

The ability to deliver healthy and nutrient-packed solutions that last longer and taste better—extends beyond plant-based beverages and other fermented snacks to applications throughout dairy alternatives, as well as in meat alternatives and the egg-free space.

For more information on DuPont plant-based solutions visit: <https://www.dupontnutritionandbiosciences.com/references/protein-infographic.html>

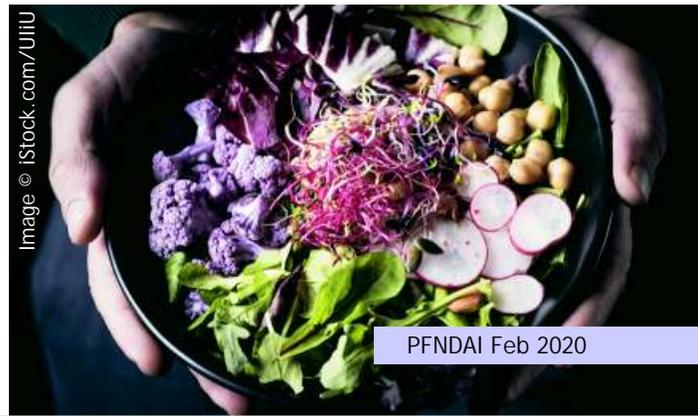


Image © iStock.com/Ulliu

COOKIES & BISCUITS AS SOURCE OF FIBRE & PROTEIN - A TWIST TO MAKE GOODIES HEALTHIER

Image © iStock.com/LauriPatterson



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The human body needs at least 35g fibre/day to work properly, e.g. for our digestive well-being and preferable is a mix of soluble and insoluble fibre. Protein is vital for our cells to build and repair tissues as well as to produce enzymes, hormones and other necessary components for our muscles, organs, skin, hair and as carrier of oxygen in the blood. Proteins are made up of various amino acids which we need a balance of - nine of them are the essential amino acids and cannot be produced by the body itself.

Bakery products are potentially good fibre and protein sources, not only soft bread but even more cookies, crisp rolls, biscuits, crackers etc. Various studies show how added fibre and protein can have a positive health and application impact on those tasty products which is interesting from a consumer perspective. The studies are mainly with fibre which contains both soluble & insoluble fibre, the protein used is from plants. There seems to be a debate if plant protein contains the essential amino acids the human body needs - we don't take part in this discussion but recommend a varied and balanced diet where plant protein can

contribute in different ways.

Some examples are fibre from apple, sugar beet, potato. The antioxidant effect prevents oxidation of the fat in cookies and biscuits formulations, thereby prolonging shelf life. A bakery tested fibre in crisp rolls as those rolls are commonly dipped in tea or coffee just before consuming. A few % fibre reinforced the product and made it take longer to dissolve in a hot drink. This is a good scenario unless you prefer to lose part of the crisp roll into the cup if it is dipped a few seconds too long.

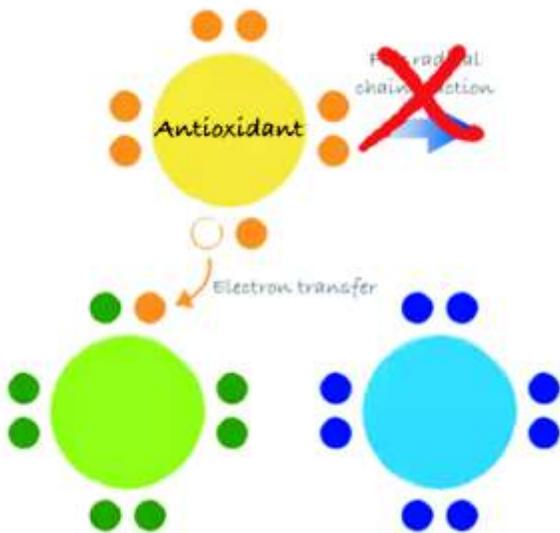
Cookie studies with plant fibre In a study (Gadhe et al 2017) high levels, up to 20%, Beet fibre from the sugar beet was tested to find out the upper limit of added fibre. The authors mention: "It was seen that fibre in the cookie formulation improved the acceptance of the product. The product was acceptable up to a 10% level, as further sugar beet fibre incorporation led to increased browning in the product and reduction in textural acceptability.

The darkening may be due to Maillard reactions between sugars and amino acids, due to a higher percentage of protein and sugar content in fibre rich cookies (Arshad et al., 2007)".

Another study (Pasha et al 2016) came up with a similar conclusion with Beet fibre in cookies: "12% level is considered as the best source of dietary fibre in bakery products and can be considered as the prospective choice to address metabolic syndromes". Chaudhary and Awasthi (2009) also reported a decrease in the appearance scores of biscuits with an increased level of bran.

With those studies in mind, there are possibilities to boost a cookie or biscuit with plant fibre as Beet fibre or similar fibre from apple, pear etc. and reach health claim levels. Concerning the darkening effect, this result may also be due to the off-white colour of Beet fibre and its protein content (10%) may contribute to the Maillard reaction.





Source: from article by Dr Jacqui Adcock on [What are antioxidants? And are they truly good for us?](#) from the Conversation (with author's permission)

This indicates the upper limits of fibre addition, a lower addition (5-10%) could be preferable to get an optimal balance of taste, functionality and fibre intake – for pure functionality to reinforce structure in cookies we have seen fine results with 1-2% fibre addition.

Antioxidant activity and Shelf life

Antioxidants are molecules that fight damage by free radicals, unstable molecules that can harm cellular structures. Antioxidants perform by giving electrons to the free radicals and neutralizing them. Free radicals generate oxidative damage e.g. in our cells or food components e.g. oil. However, free radicals are also essential for us, the body's immune cells use free radicals to kill bacteria trying to infect us. A balance is vital, we need the right number of free radicals and the right number of antioxidants to keep them in control. Soronja-Simovic et al (2013) prepared cookies according to a basic formula, both the control and various limits of added Beet fibre: Wheat flour T-500 55.5%, powdered sugar 19.4%, vegetable oil 11.5%,

table salt 0.3%, sodium bicarbonate 0.2%, ammonium bicarbonate 0.1% and water 13%. Then 7%, 9% and 11% of wheat flour T-500 were substituted with Beet fibre. All ingredients are calculated on the % wet basis, w/w.

Summary from the authors: "The obtained results indicated that the substitution of wheat flour with sugar beet fibre in the cookies upgraded their antioxidant activity and prolongs shelf life. The highest antioxidant activity and lowest IC50 values (about 0,49 g/ml) were measured in



the cookies with 11% of sugar beet fibre three weeks of storage. Cookies containing 9% sugar beet fibre had the best antioxidant properties (IC50 0.58 g/ml) after six weeks of storage". Good antioxidant activity is also seen in another study (Sakac et al 2009) where they focused on the concentrated fibre itself. The antioxidant effect in the fibre may prevent the oxidation effect of the fat in the cookies and thereby delay this process to prolong fresh holding in cookies (J. W. van der Kamp et al 2010)

Added plant protein
A report in International Journal of Chemical Studies 2018 (Studies on development of high protein cookies, Nihir Soni, Anant S Kulkarni, Luv Patel,

2018) concludes that "Cookies also are good carriers of nutrients like carbohydrate and fat which can be enriched with protein by partially replacing refined wheat flour with protein-rich flour up to an acceptable level. Protein-energy malnutrition can be combated with such high protein cookies". For example, replacing 20% wheat flour with plant protein gave an increase from 2.9% to 6.8% protein in the final cookie.

Specific amino acids vary within different plant proteins, e.g. Carob protein(photo below) has high amounts of lysine, threonine, isoleucine and leucine, giving a high total aromatic amino acid concentration. The authors mention the antioxidant properties in some plant proteins. This will most probably, together with fibre with antioxidant properties, add a beneficial antioxidant synergy effect.

Back to the initial test in crisp rolls – a control batch without fibre was made and one with an addition of 2% Beet fibre. Samples with this fibre improved the structure, it didn't grain as

the reference and performed better than the reference in the "coffee dip test". The pectin part in this fibre forms a matrix which reinforces the structure. Crisp rolls with 2 % fibre were shown to have better texture. It was generally hard to point out the crisp rolls with fibre vs the control. The fibre did not significantly change the water content or water activity.





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Conclusion:

Tasty bakery products, commonly seen as giving no significant health benefits, can be made healthier with specific plant fibres and plant proteins incorporated into the recipe. Additionally, they may get improved shelf life and structure. Cookies, biscuits and crisp rolls won't break as easy in their packaging, creating better appearance and less crumbs for producers and customers. Naturally, it can be different results in other recipe formulations – but worth trying.

The possibility to present a tasty bakery product as fibre & protein-rich with health benefits as one part in a varied and balanced diet is interesting in a world of more health-conscious people - this gives added value for the consumers. To further reduce calories there is also the option to reduce part of the sugar with plant based and safe natural sweeteners.

References:
• Studies on exploration and characterization of dietary fibre extracted from sugar beet (*Beta vulgaris* L.) and its incorporation in cookies. (Gadhe KS, Shere DM and Jarupla Surendar, 2017)

- Influence of Sugar beet dietary fibre on cookies shelf life. (Soronja-Simovic et al, Institute of Food Tech, University Novi Sad, 2013)
- Testing Sugar beet fibre in Crisp rolls (Producer test Scandinavia 2015)
- Studies on development of high protein cookies. (Nehir Soni, Anant S Kulkarni, Luv Patel, 2018)
- Carob flour and sugar beet fibre as functional additives in bread. (Soronja-Simovic et al 2016)
- Antioxidant properties of Sugar beet fibres (Maijana B Sakac et al, 2009)
- Dietary Fibre: New Frontiers for Food and Health (J. W. van der Kamp et al 2010)

- EFSA (European Food & Safety Authority, Health claims Sugar beet fibre & Pectin, Scientific opinions 2011)
- Plant Foods Have a Complete Amino Acid Composition (John McDougall, MD, 2002)
- What is the difference between animal and plant proteins? (Medical News Today, By Jon Johnson, August 2018)
- Handbook of dietary fibre (Shoo et al 2010)
- Physico-chemical and Sensory Characteristics of Beet Root Pomace Powder Incorporated Fibre Rich Cookies (Sahni and Shere 2016)
- Biochemical Characterisation and Dietary Fibre Analysis of Sugar Beet Supplemented Cookies Imran Pasha, Muhammad Farhan Jahangir Chughtai, Sabeen Akhter, Aysha Sameen and Muhammad Sajid Manzoor. National Institute of Food Science and Technology, University of Agriculture, Faisalabad, Pakistan, 2016)



Image © iStock.com/Arundhati Sathe



PFNDAI MERIT-CUM-MEANS SCHOLARSHIPS

By
Ms Anuja Rawool,
Food Scientist,
PFNDAI



Every year PFNDAI presents Merit-cum-Means scholarship to the 16 UG students of Food & Nutrition colleges from different cities in India.

This year the association has decided to award students from the different colleges and the amount for the scholarship was raised to Rs 20,000/- per student. The scholarship committee with Mr. R.D. Shenoy, Chairman & Dr J.I Lewis and Dr. V.M. Adhikari as members conducted the interviews and selected following students:

1. Ms Ansari Abir Shakeel - P.N. Doshi Women's College, Ghatkopar
2. Ms Nikita Shetty - P.N. Doshi Women's College, Ghatkopar
3. Ms Sahir Acharya- SNDT Women University S.V.T. College, Juhu
4. Ms Vaishnavi Gore - SNDT Women University S.V.T. College, Juhu
5. Ms Bhagyashri Hadkar- P V Polytechnic , SNDT Juhu
6. Ms Dhanashree Urankar- P V Polytechnic , SNDT Juhu
7. Ms Apexa Vala - P V Polytechnic , SNDT Juhu
8. Ms Neha Mishra - B.M.N. College Of Home Science, Matunga

9. Ms Preeti Madivala - B.M.N. College Of Home Science, Matunga

10. Ms Mantasha Khan – Nirmala Niketan College, Mumbai

11. Ms Shifa Maniyar - Nirmala Niketan College – Mumbai

12. Mr Prashant Jogdand - MIT College Pune

13. Ms Bhagyashri Marewad - MIT College Pune

14. Ms Aishwarya Chaitanya - SNDT of Home Science, Pune

15. Ms Aishwarya Karegoodra - University of Agriculture, Hassan - Karnataka

16. Ms Nandini B C- University of Agriculture, Hassan - Karnataka

17. Ms Sushma P S - Lady Irwin College, New Delhi

18. Ms Shalini Singh - S Rajguru College Of Appl Sci For Women, Delhi

19. Mr Vaibhav Singh - Bhaskaracharya College Of Applied Science, Delhi

20. Mr Ananda Raju Tamil Selvan- Karunya University , Coimbatore

21. Ms Yahinee Ashokan- PSGR

Krishnammal College for Women, Coimbatore

22. Ms Parvathy Mempat- N.G.P. Arts & Science College, Coimbatore

23. Ms Samah Shekshavali K - Mount Carmel College , Bangalore

24. Ms Olivia S Nath- Jadavpur University, Kolkata

25. Ms Saicharan Reddy - VNMKV - Parbhani

26. Ms Shweta Kadam- Laxminarayan Institute of technology -Nagpur

27. Mr Yogesh Mane– Shivaji University , Kolhapur

28. Ms Nisha Thakkar- MS University, Baroda

Following companies supported several students.

General Mills India (8), AAK Kamani (2), Vista Processed Foods (3), Hexagon Nutrition (1), VR Foodtech (1), Dr J.I.Lewis (2), Dr N Ramasubramanian (1) & Dr J S Pai (1)

We would like to thank all the Board Members and those who have wholeheartedly supported this Merit-Cum-Means Scholarship for the Students bright future. We congratulate students and wish them all the best for their future endeavours. Thanks

From L: Mr. R. D. Shenoy, Dr. Vilas Adhikari, Mr. Jaypal Sakhavalkar, Dr. Joseph Lewis, Ms. Anuradha Kelkar, Mr. Bhupinder Singh, Ms. Anshu Gupta, Ms. Anuja Rawool, Mr. V. Mohan, Ms. Swechha Soni, Dr. J. S. Pai & Ms. Meenu Yadav with the Scholarship Winners



Ms. Anshu Gupta- Health & Nutrition Leader-India & Menat: General Mills presenting Scholarship Award to Ms. Saher Acharya from S.V.T. College of Home Science, Juhu



Ms. Anshu Gupta- Health & Nutrition Leader-India & Menat: General Mills presenting Scholarship Award to Ms. Bhagyashri Vishvas Hadkar from Premilila Vithaldas Polytechnic College



Ms. Anshu Gupta interacting with PFNDAI-General Mills Scholarship winners 2019



Ms. Anshu Gupta- Health & Nutrition Leader-India & Menat: General Mills presenting Scholarship Award to Ms. Vaishnavi Gore S.V.T. College of Home Science, Juhu



Ms. Anshu Gupta- Health & Nutrition Leader-India & Menat: General Mills presenting Scholarship Award to Ms. Neha Mishra from Dr. B.M.N. College of Home Science



Ms. Anshu Gupta- Health & Nutrition Leader-India & Menat: General Mills presenting Scholarship Award to Ms. Dhanshree Jagdish Urankar from Premilila Vithaldas Polytechnic College

PFNDAI Scholarship Winners from Mumbai 2019





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Mr. Bhupinder Singh- CEO: Vista Processed Foods presenting PFNDAI-Vista Scholarship Award to Ms. Nikita Shetty from Smt. P. N. Doshi Women's College



Ms. Anuradha Kelkar- HR Director: Hexagon Nutrition presenting Scholarship Award to Ms. Abir Shakeel from Smt. P. N. Doshi Women's College



PFNDAI- AAK Kamani Scholarship for the year 2019 was awarded to Ms. Mantasha Rafique Khan from Nirmala Niketan college by Dr. J. S. Pai- Exe Dir: PFNDAI on behalf of AAK Kamani



PFNDAI Merit cum Means scholarship supported by Dr. Joseph Lewis was awarded to Mr. Vaibhav Singh by Dr. Pani- Principal in the presence of Mr. Bursar and Dr. Roshanlal

From L: Dr. J. S. Pai, Ms. Mantasha Khan, Dr. Joseph Lewis, Dr. Vilas Adhikari & Mr. R. D. Shenoy



PFNDAI Merit cum Means Scholarship supported by Dr. Joseph Lewis was awarded to Mr. Ananda Raju Tamil Selvan by Dr. S. Jacob K. Annamalai- Dean, School of Agriculture & Biosciences, Karunya University, Coimbatore



PFNDAI Merit cum Means Scholarship Award for the year 2019 was awarded to Ms. Sushma P. S. from Lady Irwin College, New Delhi by Dr. Anupa Siddhu-Director: Lady Irwin College & to the right Ms. Manisha Sabarwal- Incharge Dept of Food & Nutrition



PFNDAI-Vista Scholarship Award for the year 2019 was awarded to Mr. Prashant Dinkar Jogdand from MIT College, Pune by Prof. Dr. V.N. Pawar- Principal: MIT College



Ms. Aishwarya Chaitanya receiving PFNDAI Scholarship Award from Principal Dr. Muktaja Mathkari in the presence of Dr. Chandrakala Mannuru, HOD



Ms. Shweta Tukaram Kadam from Laxminarayan Institute of Technology- Nagpur receiving PFNDAI- VR FoodTech Scholarship Award from Prof. Dr. Raju Mankar (Director) in the presence of Dr. Madhukar Bhotmange (Professor & Head, Food Technology) and Dr. Mrs. S. V. Karadbhajne (Faculty Member)



Ms. Samah Shekshavali K receiving PFNDAI Merit cum Means Scholarship Award from Dr. Sangeeta Pandey (Left)- HOD: Dept of Nutrition & Dietetics & Dr. Sr Arpana (right)- Principal; Mount Carmel College



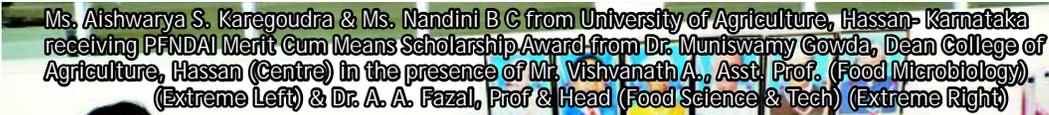
PFNDAI Merit Cum Means Scholarship Award for the year 2019 was awarded to Mr. Yogesh Mane from Shivaji University, Kolhapur by Dr. Baghe: Director (middle) & Dr. A. K. Sahoo- HOD of Food Dept (right)



PFNDAI Merit Cum Means Scholarship Award for the year 2019 was awarded to Ms. Bhagyashri Marewad from MIT College, Pune by Prof. Dr. V.N. Pawar-Principal: MIT College



Ms. Olivia S. Nath from Jadavpur University, Kolkata received PFNDAI Merit cum Means Scholarship Award



Ms. Aishwarya S. Karegoudra & Ms. Nandini B C from University of Agriculture, Hassan- Karnataka receiving PFNDAI Merit Cum Means Scholarship Award from Dr. Muniswamy Gowda, Dean College of Agriculture, Hassan (Centre) in the presence of Mr. Vishvanath A., Asst. Prof. (Food Microbiology) (Extreme Left) & Dr. A. A. Fazal, Prof & Head (Food Science & Tech) (Extreme Right)



Ms. Yahinee Ashokan from PSGR Krishnammal College for Women, Coimbatore received PFNDAI Scholarship Award supported by Dr. Ramasubramanian



From L: Prof. Srimavo Nair, Prof. Meenakshi Mehan (Head), Ms. Nisha Thakkar (Awardee), Dr. Swati Dhruv & Prof. Mini Sheth



Mr. Rohit Raut- MD, JRS Rettenmaier India with Ms. Swechha Soni presenting Scholarship Award supported by General Mills to Ms. Shifa Salim Maniyar from Nirmala Niketan College of Home Science



PFNDAI Merit Cum Means Scholarship supported by Dr. J.S. Pai was awarded to Mr. Saicharan Pannala Reddy from VNMKV-Parbhani College received by Prof. A.R. Sawate- Assoc. Dean and Principal, College of Food Technology



Ms. Madhavi Trivedi - Sr. Asso. Dir.- Nutrition & Self. Affairs, Kellogg Emerging Markets & Korea with Ms. Swechha Soni presenting Scholarship Award supported by General Mills to Ms. Apexa Kisan Vala from Premilila Vithaldas Polytechnic College



Dr. Meeta Raheja, R&D Manager JRS Rettenmaier India with Ms. Swechha Soni presenting Scholarship Award supported by General Mills to Ms. Preeti Anjappa Madiwala from Dr BMN College of Home Science



Dr. J.S. Pai, Exe. Dir. & Ms. Swechha Soni, Nutritionist with PFNDAI - General Mills Scholarship Award Winners



Dr. Deepa Joshi - Teacher Incharge Food Technology Dept presenting Scholarship Award supported by AAK Kamani to Ms. Shalini Baban Singh from Shaheed Rajguru College



Dr. V. Rajendran, Principal with Dr. D. Sri devi - HOD Nutrition & Dietetics presenting Scholarship Award to Ms. Parvathy Meempat from Dr NGP Arts & Science College

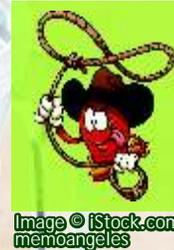


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REGULATORY ROUND UP



By
Dr. N. Ramasubramanian,
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Image © iStock.com/baibaz

Dear Readers

Here is a great piece of news. BIS has made all the standards free of cost and can be downloaded free, except a very few ones. You need to [register](#) to dive into this great standard treasure. Thank you, BIS.

Please find below notifications, orders, advisories, etc issued by FSSAI since the last round up.

[FSSAI vide its letter dated 17 January 2020 recognizes certain labelling defects as minor \(not impacting food safety\) and advises the concerned authorities to issue improvement notices instead of launching prosecution. This exemption may not be uniform for](#)

[all sectors.](#) For example – Deviation in the display and format of FSSAI logo is considered as a minor defect for all food categories (read all manufacturers). On the other hand, failure to declare lot number/batch number is considered as a minor defect in case of small scale manufacturers of sweets and savouries meant for immediate consumption. For other manufacturers, non-compliance of lot number declaration in others will not be considered as a minor defect. All are urged to have a detailed look at the directive.

[Additional list of approved laboratories in northern and eastern region.](#)

[A new directive in case of proprietary foods under the category](#)

[13.2 \(Complimentary foods for infants and young children\)](#)

[A directive setting limits for naturally occurring formaldehyde in different groups and species of fish.](#) The directive also offers guidelines for establishing specific good manufacturing practices in fish retail.

[A directive setting the migration limits for Antimony and Phthalic acid,\(2 – ethylhexy\) ester \(DHEP\) from plastic materials.](#)

[A directive on October 2019 required brandy made from molasses to be specifically declared as “Made from Molasses”. This requirement has been postponed till the final regulation is notified.](#)

RESEARCH IN HEALTH & NUTRITION



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Eating in sync with biological clock could replace problematic diabetes treatment

An early-morning, carb-filled meal improves glycemic control among diabetics

December 3, 2019 Science Daily

Type 2 diabetics inject themselves with insulin, a hormone that regulates the movement of sugar into liver, muscle and fat cells, up to four times a day. But insulin injections are linked to weight gain and the loss of control of blood sugar levels. This triggers a vicious cycle of higher insulin doses, continuous weight gain, a higher incidence of cardiovascular disease and other complications.

A new Tel Aviv University study finds that a starch-rich breakfast consumed early in the morning coupled with a small dinner could replace insulin injections and other diabetes medications for many diabetics. "The traditional diabetic diet specifies six small meals spread throughout the day. But our research proposes shifting the starch-rich calories to the early hours of the day. This produces a glucose balance and improved glycemic control among type 2 diabetics," explains Prof. Daniela Jakubowicz of TAU's Sackler Faculty of Medicine and Wolfson Medical Center's Diabetes Unit. "We believe that through this regimen it will be

possible for diabetics to significantly reduce or even stop the injections of insulin, and most of antidiabetic medications, to achieve excellent control of glucose levels."

Prof. Jakubowicz is the lead author of the study, the result of a collaboration with Prof. Julio Wainstein and Dr. Zohar Landau of Wolfson Medical Center's Diabetes Unit and Prof. Oren Froy and Dr. Shani Tsameret of the Hebrew University of Jerusalem. The research was published in *Diabetes Care* in December.

According to the new research, our metabolism and biological clock are optimized for eating in the morning and for fasting during the evening and night, when we are supposed to be asleep. "But the usual diet recommended for type 2 diabetes consists of several small meals evenly distributed throughout the day -- for example, three meals and three snacks daily, including a snack before going to sleep to prevent a drop in sugar levels during the night," Prof. Jakubowicz says. "But the '6M-diet,' as this is called, has not been effective for sugar control, so diabetics require additional medication and insulin. And insulin injections lead to weight gain, which further increases blood sugar levels," Prof. Jakubowicz adds. The researchers studied 29 type 2 diabetes participants and compared a new "3M-diet," more in alignment with our biological clock, with a control group on the

traditional 6M-diet. The experimental 3M-diet comprises a meal of bread, fruits and sweets in the early hours of the morning; a substantial lunch; and a small dinner specifically lacking starches, sweets and fruits.

The group on the traditional 6M-diet did not lose weight and did not experience any improvement of sugar levels, requiring an increase in medication and insulin doses. But the group on the 3M-diet not only lost weight but also experienced substantially improved sugar levels. "Their need for diabetic medication, especially for insulin doses, dipped substantially. Some were even able to stop using insulin altogether," adds Prof. Jakubowicz. "In addition, the 3M-diet improved the expression of biological clock genes. This suggests that the 3M-diet is not only more effective in controlling diabetes. It may also prevent many other complications such as cardiovascular disease, aging and cancer, which are all regulated by the biological clock genes." The upregulation of the biological clock gene expression in the 3M-diet might be the mechanism behind its success, as it enhances insulin secretion and improves sugar delivery into the muscles, creating a balanced daytime and nocturnal glucose metabolism. The researchers are now investigating the role certain proteins play in breakfast foods consumed by diabetics.

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How does protein fit in your holiday diet or New Year's resolutions?

December 3, 2019 Science Daily

While some diets load up on protein and other diets dictate protein sources, it can be hard to know what to consume while managing weight or during weight loss.

A new study by Purdue University nutrition scientists shows that eating more protein daily than what is recommended may benefit only a few -- those who are actively losing weight by cutting calories or those strength training to build more lean muscle mass. This study also affirms that the recommended dietary allowance, of 0.8 grams of protein per kilogram of body weight per day -- or 0.36 grams per pound -- is adequate for most people. For example, an adult who weighs 150 pounds should eat 54 grams of protein a day, which could be three ounces of lean meat, three cups of dairy and one ounce of seeds or nuts within a day.

"But here is the hard part for consumers: These findings support that most adults who are consuming adequate amounts of protein may only benefit from moderately higher protein intake when they are purposefully trying to change their body composition such as when dieting or strength training. The results are not meant to encourage everyone to increase their protein intake in general," said Wayne Campbell, a professor of nutrition science, whose research integrates exercise physiology, geriatrics and nutrition, especially protein. The study was led by Joshua L. Hudson, Purdue postdoctoral research associate, and it is published in *Advances in Nutrition*.

"This research uniquely assesses whether adults benefit from consuming more protein than the current recommended dietary allowance," Hudson said. "This research was not designed to assess whether or not adults would benefit from consuming more protein than they usually consume. This distinction is important because the recommended dietary allowance is the standard against which to assess nutrition adequacy; however, most adults consume more protein than what is recommended."

When people are in a neutral metabolic state -- not losing weight or lifting weights -- eating more protein does not influence their body composition any differently, including lean mass, which is consistent with the current recommended dietary allowances being adequate for generally healthy sedentary weight-stable people. This does not include adults with Type 2 diabetes.

"And that is important because there is so much encouragement, advertising and marketing for everyone to eat higher protein diets, and this research supports that, yes, under certain conditions, including strength training and weight loss, moderately more protein may be helpful, but that doesn't mean more is needed for everybody at all times," Hudson said. More than 1,500 nutrition articles were screened across journal databases to identify 18 studies with 22 intervention groups and 981 participants that addressed this topic. The studies were selected based on specific factors including inclusion of healthy adults, protein intake, weight loss and physical activity. The sources of protein evaluated included lean and minimally processed meats, dairy, eggs, nuts, seeds and legumes. "This research is clinically more important for women and especially older women who are known to typically consume lower amounts of protein and should be maintaining a healthy bodyweight and regularly strength

training," Campbell said.

What do these findings mean for someone watching their weight during the holidays or planning New Year's resolutions?

"If you are going to start losing weight, don't cut back across all foods you usually consume, because you'll inadvertently cut back protein. Instead, work to maintain, or even moderately increase, protein-rich foods. Then, cut back on the carbs and saturated fat-containing foods," said Campbell, who studies how sources and amounts of protein -- which is critical to building muscle mass -- may be a part of adopting healthy eating patterns, including the Mediterranean diet and DASH diet. These findings are in general, and more evaluation is needed to determine effects on age and gender. This research does not apply to elite athletes or people who lost weight with bariatric surgery, nor does it relate to protein supplements. No external funding was used for this study. Campbell's lab continues to study the influences of healthy eating patterns and diets with different amounts and sources of protein on changes in body composition and clinical health risk factors.

Have your health and eat meat too

Making a Mediterranean diet work Down Under

December 9, 2019 Science Daily

Barbecued, stir-fried or roasted, there's no doubt that Aussies love their meat. Consuming on average nearly 100 kilograms of meat per person per year, Australians are among the top meat consumers worldwide.

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PFNDAl Feb 2020

But with statistics showing that most Australians suffer from a poor diet, and red meat production adding to greenhouse-gas emissions, finding a balance between taste preferences, environmental protection, and health benefits is becoming critical. Now, researchers from the University of South Australia can reveal that Aussies can have their health and eat meat too with a new version of the Mediterranean diet adapted for Australian palates. Incorporating 2-3 serves (250g) of fresh lean pork each week, the Mediterranean-Pork (Med-Pork) diet delivers cognitive benefits, while also catering to Western tastes, and ensuring much lower greenhouse-gas emissions than beef production. A typical Mediterranean diet includes extra virgin olive oil, fruits, vegetables, nuts, seeds, legumes, wholegrain breads, pastas and cereals, moderate consumption of fish and red wine, and low consumption of red meat, sweet and processed foods. This study compared the cognitive effects of people aged 45-80 years and at risk of cardiovascular disease following a Med-Pork or a low-fat diet (often prescribed to negate risk factors for cardiovascular disease), finding that the Med-Pork intervention outperformed the low-fat diet, delivering higher cognitive processing speeds and emotional functioning, both of which are markers of good mental health.

UniSA researcher Dr Alexandra Wade says the new Med-Pork diet will provide multiple benefits for everyday Australians. "The Mediterranean diet is widely accepted as the world's healthiest diet and is renowned for delivering improved cardiovascular and cognitive health, but in Western cultures, the red meat restrictions of the diet could make it hard for people to stick to," Dr Wade says. "By adding pork to the Mediterranean diet, we're broadening the appeal of the diet, while also delivering improved cognitive function.

"This bodes well for our aging population, where age-associated diseases, such as dementia, are on the rise. "Improving people's processing speed shows the brain is working well. So, in Australia, the Med-Pork diet is an excellent lifestyle intervention where dementia is one of the leading causes of disability and the second leading cause of death. "Then, when you add the fact that pork production emits only a fraction of the greenhouse gases compared to beef, and the Med-Pork diet is really ticking all boxes -- taste, health and environment." According to the World Health Organization (WHO), by 2050, the number of people aged 60 years and older will outnumber children younger than five years old, bringing common health concerns associated with ageing into the fore. Further WHO statistics shows that cardiovascular disease is the number 1 cause of death globally and that dementia is one of the major causes of disability and dependency among older people worldwide.

Dr Wade says the Mediterranean diet with lean pork is an effective adaption of a successful eating plan "Put simply, a Mediterranean diet encourages healthy eating. It's a food-based eating pattern that, with pork, still delivers significant health benefits," Dr Wade says. "We're hoping that more people will find this dietary pattern to be more in line with their accustomed eating patterns and therefore more adoptable. "Making a Mediterranean Diet work 'Down Under' is just one step in a bigger picture for better health."

Eating more ketones may fight against Alzheimer's disease

Dietary intervention restores protective protein and decreases death rate in mice

December 9, 2019
Science Daily

A ketone-supplemented diet may protect neurons from death during the progression of Alzheimer's disease, according to research in mice recently published in *JNeurosci*.

Early in the development of Alzheimer's disease, the brain becomes over excited, potentially through the loss of inhibitory, or GABAergic, interneurons that keep other neurons from signaling too much. Because interneurons require more energy compared to other neurons, they may be more susceptible to dying when they encounter the Alzheimer's disease protein amyloid beta. Amyloid beta has been shown to damage mitochondria -- the metabolic engine for cells -- by interfering with SIRT3, a protein that preserves mitochondrial functions and protects neurons.

Cheng et al. genetically reduced levels of SIRT3 in mouse models of Alzheimer's disease. Mice with low levels of SIRT3 experienced a much higher mortality rate, more violent seizures, and increased interneuron death compared to the mice from the standard Alzheimer's disease model and control mice. However, the mice with reduced levels of SIRT3 experienced fewer seizures and were less likely to die when they ate a diet rich in ketones, a specific type of fatty acid. The diet also increased levels of SIRT3 in the mice. Increasing SIRT3 levels via ketone consumption may be a way to protect interneurons and delay the progression of Alzheimer's disease.

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Clinical study finds eating within 10-hour window may help stave off diabetes, heart disease

December 5, 2019 Science Daily

Metabolic syndrome affects nearly 30 percent of the U.S. population, and increases the risk for type 2 diabetes, heart disease and stroke. But lifestyle interventions such as adopting a healthy diet and increasing physical exercise are difficult to maintain and, even when combined with medication, are often insufficient to fully manage the disease.

Now, in a collaborative effort, researchers from the Salk Institute and the UC San Diego School of Medicine found that a 10-hour time-restricted eating intervention, when combined with traditional medications, resulted in weight loss, reduced abdominal fat, lower blood pressure and cholesterol, and more stable blood sugar and insulin levels for participants. The pilot study, published in *Cell Metabolism* on December 5, 2019, could lead to a new treatment option for metabolic syndrome patients who are at risk for developing life-altering and costly medical conditions such as diabetes. "We have found that combining time-restricted eating with medications can give metabolic syndrome patients the ability to better manage their disease," says Satchidananda Panda, co-corresponding author and professor in Salk's Regulatory Biology Laboratory. "Unlike counting calories, time-restricted eating is a simple dietary intervention to incorporate, and we found that participants were able to keep the eating schedule."

Time-restricted eating (eating all calories within a consistent 10-hour window) supports an individual's circadian rhythms and can maximize health benefits, as evidenced by previous research published by the Salk team.

Circadian rhythms are the 24-hour cycles of biological processes that affect nearly every cell in the body. Increasingly, scientists are finding that erratic eating patterns can disrupt this system and increase the risk for metabolic syndrome and other metabolic disorders with such symptoms as increased abdominal fat, abnormal cholesterol or triglycerides, and high blood pressure and blood sugar levels. "Eating and drinking everything (except water) within a consistent 10-hour window allows your body to rest and restore for 14 hours at night. Your body can also anticipate when you will eat so it can prepare to optimize metabolism," says Emily Manoogian, the paper's co-first author and a postdoctoral fellow in the Panda lab. "We wanted to know if controlling the timing of food intake to support circadian rhythms would improve the health of individuals that were already being treated for cardiometabolic diseases." "We suspected a 10-hour eating intervention might be beneficial because of Satchidananda Panda's pioneering work in animals, which showed that time-restricted eating led to dramatic health benefits, including a healthier metabolism," adds Michael Wilkinson, co-first author, assistant clinical professor of medicine at UC San Diego School of Medicine and a cardiologist at UC San Diego Health.

The pilot study included 19 participants (13 men and 6 women) diagnosed with metabolic syndrome who self-reported eating during a time window of more than 14 hours per day. Additionally, 84 percent of participants were taking at least one medication such as a statin or an antihypertensive therapy. Study participants used the Panda lab's

myCircadianClock app to log when and what they ate during an initial 2-week baseline period followed by the three-month, 10-hour time-restricted eating intervention. Nearly 86 percent of participants correctly logged their food using the app, indicating high compliance throughout the study. Participants did not report any adverse effects during the intervention. To reduce food intake to the 10-hour window, most participants delayed their first meal and advanced their last meal each day, so meals were not skipped. Although calories were not recommended to be reduced for the intervention, some participants did report eating less, likely due to the shorter eating window. Overall, participants experienced improved sleep as well as a 3-4 percent reduction in body weight, body mass index, abdominal fat and waist circumference. Major risk factors for heart disease were diminished as participants showed reduced blood pressure and total cholesterol. Blood sugar levels and insulin levels also showed a trend toward improvement.

"Metabolism is closely linked with circadian rhythms, and knowing this, we were able to develop an intervention to help patients with metabolic syndrome without decreasing calories or increasing physical exercise," says Pam Taub, co-corresponding author and associate professor of medicine at the UC San Diego School of Medicine and a cardiologist at UC San Diego Health. "If we can optimize circadian rhythms then we might be able to optimize the metabolic system." "Adapting this 10-hour time-restricted eating is an easy and cost-effective method for reducing symptoms of metabolic syndrome and improving health," adds Panda. "By delaying the onset of diabetes by even one year in a million people with prediabetes, the intervention could save roughly 9.6 billion dollars in healthcare costs." The scientists are currently conducting a clinical trial funded by

the National Institute of Diabetes and Digestive and Kidney Diseases to examine the benefits of time-restricted eating in a larger group of more than 100 participants with metabolic syndrome. The study includes additional measures that will help the researchers investigate changes in body composition and muscle function.

Vitamin D supplementation: Reviewing its importance for well-being and immunity

05 Dec 2019
Nutrition Insight

Naturally occurring in the body as a response to sun exposure, vitamin D provides a range of health benefits, from physiological to mental health. Research has noted its link to an array of health-boosting properties.

Moreover, experts and policy continue to promote supplementation with the nutrient for at-risk populations, such as those residing in countries with reduced sun exposure. NutritionInsight takes a comprehensive look at the research so far, and enlists experts' opinions on vitamin D supplementation and its importance to human health. Vitamin D can promote healthy bones and teeth; support immune, brain and nervous system; regulate insulin levels and support diabetes management; boost lung function and cardiovascular health; and influence the expression of genes involved in cancer development.

Despite its name, vitamin D is not a vitamin, but a prohormone, or precursor of a hormone. The body cannot naturally create vitamins, people can only consume them. However, it is commonly labelled as a vitamin and one that is necessary

for overall health and wellness. Recent guidelines actually suggest vitamin D fortification all year round, but especially during the winter months, Aisling Pigott, Dietician at the British Dietetic Association (BDA), tells NutritionInsight. "We know its main function involves increasing absorption of calcium, so a deficiency would reduce bone health. However, research is



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Helin Loik-Tomson

showing many other roles that vitamin D plays and there are links with mental health, sporting performance, auto-immune disease and general health," she adds. Pigott also notes that certain

populations who spend less time in the sunshine are under increased risk of vitamin D deficiency. "The very young and very elderly and those generally avoiding sun exposure are all at a deficiency risk," she says.

Can policy boost vitamin D in at-risk populations?

The vitamin is so important to human health that previous research has called for policy to take action. According to researchers at the University of Birmingham in the UK, adding vitamin D to wheat flour would prevent ten million new cases of vitamin D deficiency in England and Wales over the next 90 years. The study concludes that fortifying flour with vitamin D alone would save the public £65 million (US\$75.4 million) annually, by reducing the demand for healthcare and treatment for vitamin D deficiency and its complications. Meanwhile, the cost would be negligible. Naturally occurring in the body as a response to sun exposure, vitamin D provides a range of health benefits, from physiological to mental health. In Ireland, over a quarter of adults aged over 50 are

deficient in vitamin D, according to researchers from Trinity College in Dublin. In the study, over half (57 percent) had inadequate serum vitamin D levels, of which 26 percent were classed as vitamin D deficient. The research demonstrated that vitamin D deficiency is prevalent in older adult populations living at Northern latitudes and highlights the importance of public health strategies throughout midlife and older age, to achieve optimal vitamin D status. The researchers further emphasized the low levels of supplement use in these regions and called for food fortification and other strategies to be considered at policy level for older populations. "In a busy world where it can be difficult to remember to take supplements, there may be a role for vitamin D fortification (in some countries this happens with dairy products, for example). As we learn more about the vitamin and its important role, we may see a public health benefit to fortification," Pigott notes.

In addressing the need for consistent vitamin D supplementation, industry is coming up with applications to make supplementation easier and more enjoyable, with sprays, gummies and powder formats. Also, research quelled the fear that oral sprays are a less effective delivery format for vitamin D than tablets. Following a partnership with BetterYou, a UK-based company behind the nation's first vitamin D oral spray, scientists from the University of Sheffield found that the oral spray was as efficacious as a capsule. "While the results weren't surprising, we felt it was important to know that oral sprays – which are becoming widely available – do actually work. Critically, this means that users have a choice. Some do prefer capsules, but most preferred the ease of the spray. For people overloaded with pills, this finding could help address pill fatigue," Dr. Bernard Corfe, Senior Lecturer in Molecular

Gastroenterology at the University of Sheffield and Principal Investigator for the trial, told NutritionInsight. In the same space, Neopac and StreuliPharma simplified vitamin D supplementation for children with the launch of a dropper tube, which enables a safer and more precise administration of doses.

Research on the benefits of vitamin D supplementation

Vitamin D supplementation has been linked previously to cancer prevention. Vitamin D contributed to slowing the growth of melanoma cells and stopped their spread to the lungs of mice, according to findings from a University of Leeds study. The research also found that the vitamin influences the behavior of a signaling pathway within the cells. The researchers have highlighted that insights from this study could be used to boost the effects of immunotherapy and lead to new ways to treat the skin cancer. However, experts have warned that the results should not be interpreted as an excuse for people to stay in the sun for excessive periods of time.

Vitamin D supplementation may slow the progression of Type 2 diabetes in newly diagnosed patients and those with prediabetes. For diabetes, vitamin D supplementation may slow the progression of Type 2 diabetes in newly diagnosed patients and those with prediabetes, according to a study published in the European Journal of Endocrinology. The study highlighted that high-dose supplementation of vitamin D can improve glucose metabolism to help prevent the development and progression of diabetes. Although the results are promising, the researchers note it is imperative to evaluate the safety of high-dose vitamin D supplementation in the long term. An additional study, found that infants and young children with low levels of vitamin D may be at greater risk of high blood pressure later in childhood.

The Boston Medical Center, US study, published in the American Heart Association's (AHA) journal Hypertension, found that children born with adequate vitamin D levels, compared to children born with low levels, had about a 60 percent higher risk of elevated systolic blood pressure between ages six and 18. The researchers have flagged vitamin D testing and treatment during pregnancy as necessary in order to prevent high blood pressure later in life.

What's next

Whether supplementation or fortification is the answer remains unclear. Sun exposure is the easiest way but not always possible. Despite the method of application, the importance of the micronutrient for health is backed by science and supplementation and fortification can prove viable ways to avoid deficiencies.

By KristianaLalou

Early weaning may increase risk of diabetes, Brazilian rat study finds

12 Dec 2019 Nutrition Insight

Breastfeeding may have an important role to play in preventing short- and long-term diabetes, according to a recent rat study conducted at the Rio De Janeiro State University, Brazil.

The results reveal that early weaning leads to increased insulin secretion in adolescent male rats, as well as reduced insulin secretion in adult offspring. Considering insulin resistance is one of the primary factors for the development of Type 2 diabetes, this study demonstrates the importance of breastfeeding in the fight against the disease. "There are many causes of Type 2 diabetes, but not breastfeeding for long enough

is one cause that we can do something about. Understanding the increased susceptibility to Type 2 diabetes as a result of early weaning will help us develop the best public health guidance," says Patricia Cristina Lisboa, the study's lead author. The researchers showed that weaning infant rats early increased insulin secretion in adolescent male pups and in both genders as adults. This increased insulin secretion is indicative of developing insulin resistance, which translates into reduced responsiveness to insulin. In response to compensating for this reduced responsiveness of the body, it secretes more insulin. This is one sign of diabetes, a disease characterized by high blood sugar levels. Blood sugar levels are normally regulated by insulin, so higher blood sugar levels mean the body creates more insulin to try to regulate this. The study, therefore, concludes that this result of increased insulin secretion indicates that the rat pups might be more susceptible to Type 2 diabetes, as will all the offspring in adulthood.

Previous research and industry innovation

This research on breastfeeding comes as academia is currently calling for more studies on the composition of breast milk. By identifying and clarifying the causes of the health benefits of breastfeeding, experts could be better equipped to establish better treatment options in the future. This is according to Afif El-Khuffash, Honorary Clinical Professor of Paediatrics at RCSI and Consultant Neonatologist at The Rotunda Hospital. "The current evidence comes from observational studies, which highlights the strong link between early breast milk administrations and improvement in long-term heart health, but it lacks concrete mechanistic explanations," El-Khuffash says.



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Indeed, research shows that a baby's first 1,000 days of life, from conception to the age of two, are the most important for future development. Indicated by prominent medical and nutrition organizations, breast milk and infant formula, alongside water and plain milk, are part of comprehensive beverage recommendations for children from birth through age five. As breastfeeding remains a vital part in children's early nutrition, industry continues to provide formula for breast milk in this space. Examples include Advanced Lipids' Infat range of ingredients for infant formula, as well as Nestlé's recent probiotic solution for lactating mothers. Also active in this space, Bunge LodensCroklaan unveiled its "next-generation" infant formula product at Fi Europe 2019, in Paris, France, last week. Betapol Plus, which received the Fi Europe 2019 Innovation Award for Functional Innovation, is marketed as a premium quality oleic-palmitic-oleic (OPO) lipid product for infant formula.

Edited by Anni Schleicher

Saffron extract may help adults with depressive symptoms

IFT DAILY NEWS
November 20, 2019

A study published in the *Journal of Psychopharmacology* suggests that *Crocus sativus* L., an extract from Spanish saffron is well tolerated when administrated with antidepressant drugs and may help reduce depression in adults with persistent depressive symptoms.

In an eight-week, randomized, double-blind, placebo-controlled study, adults with persistent depression, currently taking a pharmaceutical antidepressant were given a placebo or a saffron extract

(Pharmactive's affron, 14 mg twice daily). Of the 160 participants enrolled, 139 provided usable data. Based on the clinician-rated Montgomery-Åsberg Depression Rating Scale (MADRS), depressive symptoms decreased more in participants taking saffron compared with a placebo, with reductions of 41% and 21%, respectively.

However, scores on the participants' self-rated MADRS-S decreased 27% and 26% in the saffron and placebo conditions, respectively. Saffron was associated with a greater reduction in adverse effects of antidepressants, although this was non-significant after covarying for baseline values. Quality of life improved in both groups with no significant between-group differences.

The researchers concluded that "adjunctive administration of a standardized saffron extract for eight weeks was associated with a greater improvement in depressive symptoms as measured by the clinician-rated MADRS but not the self-report MADRS-S. Given the conflicting results, further research is

needed to clarify the clinical benefits of saffron as an adjunctive treatment for adults with persistent depressive symptoms despite antidepressant drug treatment."

Exploring the role of the gut microbiome in Alzheimer's

IFTNEXT | ARTICLE
November 8, 2019

Research by scientists at Wake Forest School of Medicine suggests that diet has the

potential to affect the gut microbiome in ways that could decrease the risk of Alzheimer's disease.

In a small pilot study, the researchers identified several distinct gut microbiome signatures—the chemicals produced by bacteria—in participants with mild cognitive impairment (MCI) but not in their counterparts with normal cognition. They found that the bacterial signatures correlated with higher levels of markers of Alzheimer's disease in the cerebrospinal fluid of the participants with MCI. Through cross-group dietary intervention, the study also showed that a modified Mediterranean-ketogenic diet produced changes in the gut microbiome and its metabolites that correlated with reduced levels of Alzheimer's markers in the members of both study groups.

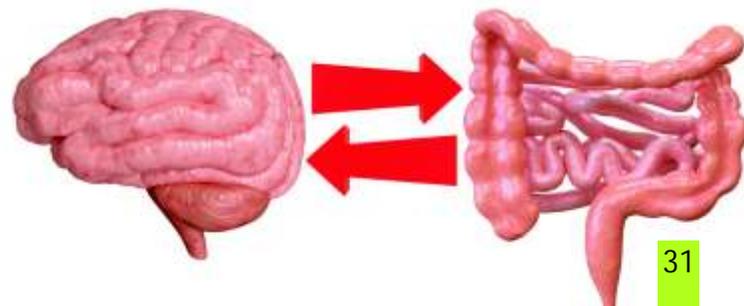
"The relationship of the gut microbiome and diet to neurodegenerative diseases has recently received considerable attention, and this study suggests that Alzheimer's disease is associated with specific changes in gut bacteria and that a type of ketogenic Mediterranean diet can affect the microbiome in ways that could impact the development of dementia," said study co-author Hariom Yadav.

The randomized, double-blind, single-site study involved 17 older adults, 11 with diagnosed MCI and six with normal cognition. The participants were randomly assigned to follow either the low-carbohydrate modified Mediterranean-ketogenic diet or a low-fat, higher carbohydrate diet for six weeks.

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After a six-week “washout” period, each group switched to the other diet. Gut microbiome, fecal short-chain fatty acids, and markers of Alzheimer’s, including amyloid and tau proteins, in cerebrospinal fluid were measured before and after each dieting period.

Although the study lacks diversity due to the small subject group size, Yadav notes that the “findings provide important information that future interventional and clinical studies can be based on. Determining the specific role these gut microbiome signatures have in the progression of Alzheimer’s disease could lead to novel nutritional and therapeutic approaches that would be effective against the disease.”

Diet and depression: Australian study links healthy diet with reduced symptoms in women but not men

By Guan Yu Lim 12-Nov-2019 - Food Navigator Asia

A healthy dietary pattern with frequent intake of fruits, vegetable and fish was associated with lower levels of depressive symptoms in older Australian women, but the association was not significant in men.

Likewise, an unhealthy dietary pattern observed in Australian women was associated with higher levels of depressive symptoms, but not men. Researchers from Australia published their findings on the British Journal of Nutrition. The study wanted to examine the association between current and past dietary patterns and depression in people aged 55 years and over, because previous studies had focused on the general adult population aged from 21 years, or

older adults 65 years and over. Researchers said: “These studies may have excluded the decade prior to age 65 when changes to depressive symptoms may be occurring.” Understanding these associations is important as this knowledge can inform the development of evidence-based, appropriately timed dietary strategies to prevent poor mental health.”

In the current study, a total of 2142 participants completed the Wellbeing, Eating and Exercise for a Long Lifestudy in Victoria, Australia. Data from self-administered questionnaires were collected at three phases, T1 (2010), T2 (2012), and T3(2014).



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Depressive symptoms were assessed using the Geriatric Depression Scale (GDS). A GDS score of 11 or greater may be an indicator of depression. Dietary intake was assessed at T1 and T3 using a food frequency questionnaire over the previous six months.

Current diet and mental health The findings suggested that a current healthy dietary pattern (characterised by frequent intake of vegetables, fruit and fish) was significantly associated ($\beta = -0.260$, 95% CI -0.451, -0.070) with lower levels of depressive symptoms in women. A current unhealthy dietary pattern in women (characterised by frequent intake of red and processed meat, potatoes, hot chips, cakes, desserts and ice cream) was associated with higher levels of depressive symptoms ($\beta = 1.367$, 95% CI 0.679, 2.056).

In men, the healthy dietary pattern

(characterised by frequent consumption of vegetables, fish and other seafood, oil and vinegar salad dressings, rice, legumes and beans, cottage or ricotta cheese and fruit saw a higher score for the association with lower levels of depressive symptoms, however the association was not significant. The unhealthy dietary pattern (characterised by red, processed and cured meat, pizza or hamburgers, white bread, fried or battered fish, high energy drinks, hot chips or roast potatoes and muesli or porridge) was also not significantly associated with depressive symptoms.

Past diet and depression

The researchers also wanted to examine longitudinal associations of past dietary patterns at T1 and depressive symptoms at T3 (present). In women, past healthy dietary patterns were associated with lower levels of depressive symptoms ($\beta = -0.201$, 95% CI -0.390, -0.013). In men, no associations were found between dietary patterns and depressive symptoms.

Lower inflammation

The researchers said healthy dietary patterns in this study was similar to that of the Mediterranean diet in that vegetables, fruit, legumes, seafood are primary constituents of the diet. Healthy dietary patterns have been associated with lower levels of inflammatory biomarkers including C-reactive protein and interleukin-6 indicating lower levels of inflammation. Conversely, unhealthy dietary patterns have been linked to increased levels of the same inflammatory biomarkers indicating higher levels of inflammation. Another explanation for why diet may be related to depressive symptoms may be related to fibre intake. A higher intake of dietary fibre has been associated with lower levels of the inflammatory biomarker C-reactive protein which may also decrease systemic inflammation.

No association in men

However, researchers were puzzled on why the association was not seen in men. They postulated, “It is also possible the different findings by sex reflect differences in how dietary data collection methodologies are perceived and completed by both men and women ,The present study identified slightly different dietary patterns for men and women in that the healthy dietary pattern was the same except for men it also included oil and vinegar salad dressings, rice and cottage or ricotta cheese, The unhealthy dietary patterns were also similar with the exception that this pattern in men also contained pizza and hamburgers, fried or battered fish, hot chips or roast potatoes and muesli or porridge, The difference in dietary patterns may be due to differences in actual intakes or potentially a difference in the accuracy of the FFQ recall between men and women.” They said future studies were needed to confirm these findings and to understand why differences may occur by sex and potential implications in nutritional epidemiology. They concluded that their findings could add onto the growing body of evidence that a healthy dietary pattern was associated with better mental health in older people.

Higher fish consumption associated with lower dementia risk in elderly Japanese

By Guan Yu Lim 14-Nov-2019 -Food Navigator Asia

Habitual fish intake may be beneficial for the prevention of dementia in healthy Japanese elderly people without disabilities.

Only five previous studies were



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known to investigate this association, although findings were inconsistent, with three of the studies reported benefits that were not statistically significant. As Japanese people consume the highest per capita of seafood in the world, researchers wanted to study the association between fish consumption and onset of dementia. They published the study in the British Journal of Medicine.

Participants for this study were recruited from the Ohsaki Cohort 2006 Study, residing in Ohsaki city, Japan. A total of 13,000 individuals aged 65 years and above without disability were analysed and followed for 5.7years Food frequency questionnaires were used to collect data on consumption of fish and other foods at baseline. In this study, fish referred to raw/broiled/grilled fish as well as boiled fish paste. Daily fish consumption was categorised into four quartiles: Q1 (lowest), Q2, Q3, and Q4 (highest). Respondents in Q1 were the reference category. The primary outcome of this study was the onset of dementia, defined as disabling dementia or incident functional disability according to the criteria of the LTCI system used in Japan. The dementia scale is classified into six ranks (0, I-IV, and M) with rank M representing severe dementia-related behavioural disturbance that require medical intervention. A rank exceeding I is typically used as an outcome measure of incident dementia because individuals who have mild or moderate dementia are classified as rank II.

Fish findings

This study reported that compared to Q1 (lowest fish intake), the hazard ratio for incident dementia was 0.77 for Q2, 0.74 for Q3 and 0.70 for Q4 (p<0.01). The researchers said: “An inverse association between fish consumption and the onset of dementia was observed, suggesting the potential benefits of fish intake for dementia prevention.” Japan is

estimated to have 1.1 million elderly (33%) suffering from dementia by 2060, and researchers said this result may hint in preventing dementia, “bringing huge benefit on our society in terms of quality of life, caregiver burden, costs for medical and long-term care .” The Japanese diet includes oily fish such as salmon, tuna, amberjack, and pacific saury. The researchers explained fish contain n-3 fatty acids, such as eicosapentaenoic acid and docosahexaenoic acid, which are suggested to have preventive effects against cognitive decline. Other nutrients in fish, such as vitamin A/carotenoids, vitamin B12, vitamin D, vitamin E, and selenium, are also known to have neuro-protective effects.

Limitations

However, there were some limitations acknowledged in this study. One of which was the collection of fish consumption data only at baseline. Some of the study participants may have changed their fish intake during follow-up. The researchers also thought their 5.7 years of follow-up was relatively short and may have compromised the results. They suggested conducting future cohort studies with a longer follow-up period.

Improved WIC nutrition reduces obesity risk among young kids, study says

By Mary Ellen Shoup 29-Apr-2019 - Food Navigator USA

Improved nutritional standards of The Special Supplemental Nutrition Program for Women, Infants and Children (WIC) have been effective in reducing obesity risk in four-year-olds, according to a new study.



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Researchers from Tulane and the UCLA Fielding School of Public Health worked with Los Angeles-based PHFE WIC, a program of Heluna Health, to examine health and population data from more than 180,000 children served by the WIC program in Los Angeles County where over half of all children under the age of five are enrolled in WIC. Updates to the WIC food packaging, which were implemented in 2009 based on 2005 USDA Dietary Guidelines, included nutritional improvements and more WIC-eligible products such as whole grain breads and cereal, as well as more fruits and vegetables. The final rule included a more than 30% increase in the dollar amount for fruit and vegetable purchases for children, fresh infant food (instead of jarred), and yogurt as a partial milk substitute.

The study examined data from 2003-2016 for four groups of children: those receiving a full-dose (i.e. participating in WIC continuously from birth to age four) of the new food packaging with improved nutritional standards; those receiving a full-dose of food under the old food packaging reflecting past nutritional requirements; those receiving a late-dose (i.e. joining WIC at age two and participating until age four) of the new food packaging; and those receiving a late-dose of the old food packaging.

Early nutrition intervention

"Our study shows that improving nutrition quality made a measurable impact in lowering obesity risk for children receiving the new food package compared to those receiving the old," said lead author Pia Chaparro, assistant professor of nutrition at Tulane University School of Public Health and Tropical Medicine. "Our results suggest that changes in children's diet early in life could have a positive effect on their growth and reduce obesity risk, which could be informative for policymakers

considering further improvements to the WIC program."

Children receiving a full dose of the new food package had healthier growth trajectories and lower obesity risk at age four than children receiving a full dose of the old food package, according to the study. Obesity risk was 12% lower for boys and 10% lower for girls compared to four-year-olds who received the full dose of the old food package. When researchers examined growth trajectories between the two groups, they noticed the sharpest differences began to develop at six months of age.

"The beneficial effect of being exposed to the new food package, compared to the old one, was much stronger during the six months to 1-year age interval, and this difference between the two groups during this age interval was large enough to set children in the new food package group on a healthier growth trajectory through age 4," Chaparro said. Of those who joined the WIC program at the age of two, researchers found an 11% lower obesity risk for boys receiving the updated WIC packaging but no reduced risk for girls.

Improving mood: Medlab underlines how microbiome modulation can improve cognitive disorders

By TingminKoe 14-Nov-2019 - NutraIngredients Asia

Probiotics supplementation could improve a dysbiotic gut, and in turn manage mood disorders, including major depression.

This is according to scientific research findings from Professor Luis Vitetta, the director

of medical research, and his team at Medlab Clinical. He was speaking at Probiota Asia summit organised by NutraIngredients-Asia in Singapore, where he spoke in detail about the research conducted at the Australia-based firm.

The gut and the brain

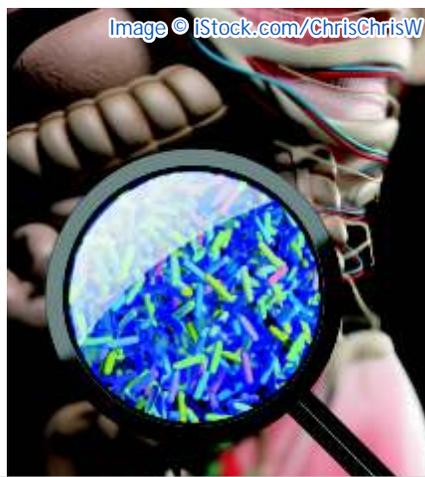
The gut microbiome is at the centre of modulating homeostasis and balance in organ physiology, Vitetta pointed out. Homeostasis which is out of balance could in turn lead to a host of conditions, such as mood problems. An important component linking brain to gut is the vagus nerve, which transports information from the gastrointestinal gut to the brain and vice versa. Specifically, 80% of the vagus nerve afferent fibres transport information from the gastrointestinal tract to the brain, and 20% if the vagus nerve efferent fibres transport information from the brain to the gastrointestinal tract.

By reading the gut microbiome, the vagus nerve initiates a response to modulate inflammation based on its detection of a pathogenic or non-pathogenic organism. In this way, the gut microbiome can exert an effect on a person's mood and stress levels.

The orotate-uridine connect

Having established the gut-brain relation, the firm went on to find out the components which affect mucosal immunity in the gut, one of which is uracil. "We found that bacteria-derived uracil units could actually modulate mucosal immunity in the gut, and one can actually recover from inflammation

in the gut associated with a particular mood disorder, whether it is anxiety or some form of depression," Vitetta said. This works when uridine metabolites present in the red blood cells are transported across the blood-brain barrier and into the brain.



When researching the pathway in which uridine is produced, the firm found that it is converted from orotate and from here, established a connection between orotate and uridine. The firm then conducted a pilot study to validate the ability of magnesium orotate supplementation for reducing depressive symptoms in patients who were not responding to anti-depression medications. After eight weeks of 1600mg of magnesium orotate supplementation, there was significant clinical improvement in the patients based on their BDI, OQ45, and QOL scores.

Speeding up with probiotics

In its research, the firm further found out the relationship between mitochondria and intestinal microbiota and probiotics in reducing depression symptoms. In a recently published opinion article on Journal of Cellular Biochemistry, Vitetta and his team pointed out the role of mitochondria as a potential mediator linking the intestinal microbiota to depression. "We found that the bacteria in the gut are intimately associated with mitochondrial dysfunction. And the key mediator is a probiotic that carries the intestinal microbiome to overcome the dysbiotic effect," he said.

Based on the findings, the firm then went on to conduct another pilot study. This time round, it looked at the combination of probiotics and magnesium orotate in attenuating depression in patients resistant to anti-depressant medication. In this study, there was a quicker response, with improvement seen at week four. He explained that this was because the patients were recovering from a dysbiotic gut due to probiotics and also, the orotate-uridine connection had helped to produce an improved output. He concluded that probiotics were seen as an adjunctive medicine and "not a panacea to fix everything."

Ongoing studies

Building on these findings, the firm has now invested in a million-dollar clinical trial on its NRG Biotic supplement formula. Containing magnesium orotate, coenzyme Q10, and three probiotic strains, the purpose is to find out the role of these compounds in managing depression.

The appendix myth

In addition, Vitetta also highlighted findings on the usefulness of the appendix as a source of beneficial bacteria. The appendix has been traditionally thought to be a vestigial organ which is not necessary for normal body function. Citing existing studies conducted by other researchers, he pointed out how the appendix was a "safe house" for healthful bacteria and repopulates the gut with bacteria beneficial for digestive functions. He also pointed out how some research had suggested the link between the appendix and neuro-degenerative disease, such as Parkinson's disease, but further research is required.

More validation, standardisation, and mechanism of action studies needed to address gaps in probiotics research

By Guan Yu Lim 07-Nov-2019 - NutraIngredients Asia

There is a need for more validated, standardised, randomised control trials (RCT) studying the mechanism of action in probiotics research.

These were the key findings of an expert panel convened at our recent Probiota Asia Summit held in Singapore, and moderated by NutraIngredients-Asia editor Tingmin Koe on what needs to be done to address them. Panelist Dr Christopher Martoni, principal scientist at UAS Labs, said high-quality clinical trials were essential for the sector to thrive.

"RCT is the gold standard for clinical research," he said. Another panelist, Dr Chyn Boon Wong, research associate at Morinaga Milk Industry, added that the number of subjects and "whether the study is well powered are also very critical criteria for clinical research." Meanwhile Nutrasource's Joshua Baisley, vice president of clinical design and delivery, added: "Documentation and validation of your data is also very important. These should be filed right at the start, and not afterwards."

Current gaps

The panelists jointly agreed there were gaps in the current probiotics research, especially on the mechanism of action. Martoni said there was a need to continue to invest in RCTs with robust study designs. "The key gap here is in the mechanism of action, we need to understand where the probiotics are acting, where the target sites are." Some clinical trials were also lacking in information on both responders and non-responders, according to Martoni, who called for more information on efficacy.

Wong added: "The mechanism of action is one thing that we have been neglecting. I agree it is very important to understand the science behind the probiotic strains, especially how it works and what interactions they have." She said advanced technology like metabolomics may help better understand these strains and the effects seen in clinical efficacy. "Through technology, we can study the types of metabolites being produced that can act as mediators in the gut, and communicate with the gut microbiome," she added.

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Probiotics 35

Wong said learning how to modulate the gut, and mediate or eliminate hyper-inflammatory responses in the gut, could eventually help understand many diseases and disorders. Baisley pointed out that another area that could be improved was within the industry itself, where many sponsors were running clinical trials as a one-off study. This creates a gap in terms of the validation of clinical data management and an inability to pull data together, even though studies often work on the same strain or genus. “It is very difficult because we are all collecting data in different ways. There needs to be some sort of standardisation,” he said.

Regulators criteria

Koe posed a question to the panelists on what regulators were looking out for given that there were different standards in probiotic research and different budget expectations. Baisley answered that regulators were comfortable with the pharmaceutical industry which required preclinical research, and this created challenges for the probiotic and dietary supplement industry. “We see now in APAC, regulators want to see studies conducted in their geographic population,” he said. He added that the ICH-GCP (International Council for Harmonization-Good Clinical Practice) is an important criterion that regulators would take note.

Even though it was set up as a pharmaceutical guideline, Baisley said “The criteria in there is not pharmaceutical, it’s best practices and protocol. It’s about how you design your studies, what you need to include in your protocol, how to ensure people can execute your study etc.”

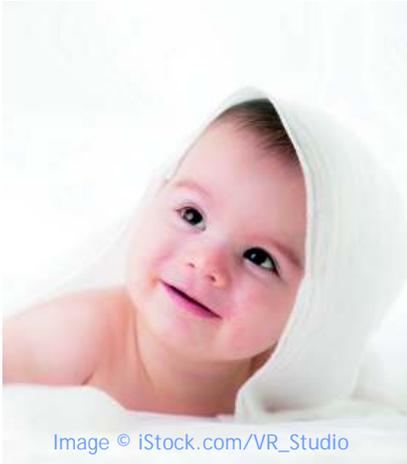


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Morinaga research reveals key immunity-boosting metabolite produced from infant gut

By Guan Yu Lim 22-Nov-2019 - NutraIngredients Asia

Research from Morinaga Milk Industry has found that the infant-type human-residential

bifidobacteria (HRB) could produce a key metabolite, the immunity-boosting indole-3-lactic acid (ILA), moving one step closer to understanding its benefits on infant health.

This means that, “Strains of infant-type HRB could be better probiotic candidates for infant use,” said Dr Chyn Boon Wong, research associate at Morinaga Milk Industry told NutraIngredients-Asia. The firm said infant-type HRB was compatible with breast milk, because it is capable of utilising human milk oligosaccharides (HMOs), and was highly tolerant to lysozyme, a natural antibacterial factor present in the human body.

“Over the last two decades, many attempts have been made to mimic the gut microbiota of breast-fed infants in formula fed infants, which have been studied as an underlying driver in various disease development,” Wong said. She observed: “In recent years, in the APAC region, there has been a remarkable rise in the desire of parents to feed their babies foods containing functional ingredients such as probiotics and prebiotics as a means to promote healthy growth and development of the babies .”

Research findings

Researchers had conducted a study to investigate the functional role of infant-type HRB in infant health, and in doing so, examine the metabolites produced by different strains of bifidobacterial species.

They reported that strains of infant-type HRB, including *B. longum* BB536, *B. breve* M-16V and *B. infantis* M-63, produced higher levels of ILA than other species.

ILA is a tryptophan metabolite involved in the immune development of infants, although its biological meaning is unclear. Wong explained: “It is believed that this metabolite specifically produced by infant-type HRB could be involved in the immune development in infants, for which ILA has been reportedly involving in inducing immunoregulatory T cells and suppressing inflammatory T cells.”

Trends

Wong said the new discovery on the metabolite of human bifidobacteria was a breakthrough in the field and would add value to infant nutrition products. “With the rising demand for healthy baby food, the infant nutrition market is expected to grow fast in the APAC region,” she added. The firm will continue further research on the functional roles of HRB in infant health to better understand why and how this group of bifidobacterial species contribute to human infant growth and health development. Morinaga Milk Industry currently carries four main HRB probiotic strains (BB536, M-16V, M-63 and B-3) that are effective at helping the human host achieve optimal health and are suitable for human use, especially in infants.

The paper concluded: “Strains of bifidobacterial species commonly isolated from the intestines of human infants, such as *Bifidobacterium longum* subsp. *longum*, *Bifidobacterium longum* subsp. *infantis*, *Bifidobacterium breve*, and *Bifidobacterium bifidum*, produced higher levels of ILA than did strains of other species. These results imply that infant-type bifidobacteria might play a specific role in host-microbial cross-talk by producing ILA in human infants.”

Mother-baby link: Probiotic intake during pregnancy improves infant immunity by reducing risk factors

By TingminKoe 12-Nov-2019 - NutraIngredients Asia

Several human and animal studies highlighted have shown that probiotics supplementation in pregnant mothers can improve new-born immunity and reduce the risk of pre-term birth.

The findings were presented by Dr Anders Henriksson, application and technical support leader of human health at DuPont Nutrition & Biosciences, when he was presenting at our Probiota Asia summit held in Singapore recently. A risk factor that can affect infants' immunity and later part of their lives is gestational diabetes mellitus (GDM) in pregnant mothers. A systematic review has shown that the offspring of GDM mothers have higher blood glucose levels and obesity. However, a randomised controlled trial by the firm in New Zealand showed that supplementing *L. Rhamnosus* HN001 during early pregnancy may reduce the prevalence of GDM. A total of 423 subjects took part in the study, with about half of them supplemented with the probiotic from the first trimester to six months after birth. Findings showed that the probiotic reduced the risk of GDM most effectively in mothers above the age of 35. For instance, in mothers older than 35 years old, their prevalence of GDM was 7.1%, while that of the placebo was 22.9%. The effect of the probiotic was less obvious in mothers younger than 35 years old, with the prevalence of GDM in both placebo and treatment group between 8.5% and 8.8%. Probiotic supplementation also helped to prevent future episodes of GDM. For mothers who have a previous history of GDM, the prevalence of GDM dropped to 0% in the treatment group, while the rate of prevalence was as high as 87% in the placebo group.



Infants' immune health
Besides managing GDM, the effects of *L. rhamnosus*HN001 supplementation during pregnancy was also extended to the infants. In a 2006 study, the mothers were given *L. rhamnosus*HN001 in the later stage of their pregnancy until six months after giving birth. Findings showed that these mothers have a higher level of immune market IFN-gamma in their cord blood. Individuals suffering from allergic symptoms typically have lower levels of IFN-gamma. "When it comes to newborns, we also know we have the immuno-opportunity. We know that the gut microbiome is established within the first couple of years, the first two or three years and that the gut microbiome that's established will have an impact on the immunity. "If we administer these particular probiotic strains to mothers during pregnancy, it will bring some significant benefits for the health of the newborns," Henriksson explained. Supplementing infants with *L. rhamnosus*HN001 can also provide direct benefits. In the same study, the infants were fed with the same probiotic strain until 20 years old, and immune problems, such as wheezing, atopy, and hay fever were monitored. In the case of eczema, the treatment group experienced a 42% lower cumulative prevalence over the first 11 years of life.

Reducing risks of pre-term birth
Studies conducted by the firm also showed that probiotics intake can act as an adjunctive in alleviating periodontitis and improving vaginal microbiome, both of which play a role in causing preterm birth. For

alleviating periodontitis, a human study published last year found that *Bifidobacterium lactis*HN019 supplementation as an adjunctive to scaling and root planing (SRP) was effective.

Forty-one mothers over 30 years old suffering from periodontitis were recruited for the study. The treatment group consumed a lozenge containing 1bn CFU of *Bifidobacterium lactis* HN019 twice per day for 30 days. Results showed that the treatment group presented a decrease in probing pocket depth and a clinical attachment gain significantly higher than the control group at 90 days. The treatment group also had fewer periodontal pathogens of red and orange complexes.

On other hand, probiotics intake can also modulate vagina microbiome, in turn, preventing a dysbiotic vagina microbiome and reduce risks of preterm birth. A study published earlier this year showed that a combination of *L. rhamnosus*HN001 and *L. acidophilus* La-14 can reduce the symptoms of vaginal discharge and itching. Conducted in Brazil, 48 women with recurrent bacterial vaginosis took part in the study. The treatment group was given a combination of HN001 and La14 with lactoferrin as an adjunctive therapy to metronidazole medication. Findings showed that the population levels of *rhamnosus* and *acidophilus* had increased. "This shift in population levels to more predominant levels of *lactobacillus* had been shown to change the nugent score, which is expected to have an effect on the severity and prevalence of bacterial vaginosis," Henriksson said.

Post-natal depression and anxiety
The concept of the gut-brain axis also means that probiotics can be potentially used to address problems such as post-natal depression and anxiety. Henriksson pointed out that safe, effective therapies were needed,

as women were often reluctant to take anti-depressant medication during pregnancy or while breast feeding. In a study published in 2017 on 423 women with postnatal depression and anxiety, it was shown that *L. rhamnosus* HN001 has an effect on improving the psychological outcomes. Findings showed that the number of women with depressed symptoms was lower in the treatment group at 16.5% as compared to the placebo at 23.5%. Fewer women from the treatment group also said they felt anxious at 15.6% as compared to the placebo at 29.4%. In conclusion, he said that there were opportunities for product development, could be for mothers, newborns, preparation for reducing risks of pre-term births.

Scientists at MIT develop new technology to combat malnutrition

By Danielle Masterson 15-Nov-2019 - NutraIngredients Asia

A new way of encapsulating micronutrients could be the key to a healthier world.

Nutrition deficiencies wreak havoc on cognitive and physical health, as well as contribute to disease. With as many as 2 billion people across the globe affected by malnutrition, it remains a top public health concern in developing nations. While food fortification is effective in treating micronutrient deficiencies, its global implementation has been challenging given the technical limits posed by micronutrient stability during cooking and storage, which prevents adequate absorption.

Cooking up a solution

With funding from the Bill and Melinda Gates Foundation, MIT scientists set out to develop new microparticle platform that could help fortify foods with essential

micronutrients. The researchers developed a new strategy for encapsulating nutrients that made it easier to fortify foods by enclosing them in a biocompatible polymer compound (BMC) that prevents the nutrients from being degraded during storage or cooking. BMC is currently used in dietary supplements, and in the United States it is classified as "generally regarded as safe."

Scientists found that they were able to encapsulate 11 different micronutrients, including zinc, vitamin B2, niacin, biotin, and vitamin C, as well as iron and vitamin A using this polymer. They also demonstrated that they could co-encapsulate up to four of the



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micronutrients together. "We are really excited that our team has been able to develop this unique nutrient-delivery system that has the potential to help billions of people in the developing world," said

Robert Langer, a research scientist at MIT's Koch Institute, and senior author of the study.

From inception to human clinical trials

Lab tests showed that the encapsulated micronutrients remained intact after being boiled for two hours, and were protected from ultraviolet light as well as from oxidizing chemicals. Once introduced to very acidic conditions, similar to those found in the stomach, the polymer becomes soluble and the micronutrients were released. The researchers first tested mice and found that particles broke down in the stomach, as expected, and then travelled to the small intestine to be absorbed.

Following the mouse success, the researchers put the pH-sensitive,

heat-stable encapsulated micronutrients to the test in human subjects. In their first trial, the researchers incorporated encapsulated iron sulfate into corn porridge, a common food in developing world. It was given to female university students in Switzerland, most of whom were anemic. That study found the subjects did not absorb as much iron as the researchers had hoped. The amount of iron absorbed was less than half of what was absorbed by subjects who consumed iron sulfate that was not encapsulated.

Take two

Researchers went back to the drawing board to reformulate the particles. They found that if they increased iron sulfate in the particles from 3% to 18%, they could achieve iron absorption rates similar to the percentage for unencapsulated iron sulfate. "Reformulation of the microparticles was possible because our platform was tunable and amenable to large-scale manufacturing approaches," said Aaron Anselmo, the paper's lead co-author. "This allowed us to improve our formulation based on the feedback from the first trial."

The researchers are now working on gaining regulatory approval from the Joint Food and Agriculture Organization/World Health Organization Expert Committee on Food Additives (JECFA) so that they can conduct a similar study in a developing country, where micronutrient deficiencies are more common. The authors conclude, "Using process development approaches capable of kilogram-scale synthesis, we increased iron loading more than 30-fold. Scaled batches tested in a follow-up human study exhibited up to 89% relative iron bioavailability compared to free iron. Collectively, these studies describe a broad approach for clinical translation of a heat-stable ingestible micronutrient delivery platform with the potential to improve micronutrient deficiency in the developing world."



& FOOD SCIENCE & INDUSTRY NEWS

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Less rice, more nutritious crops will enhance India's food supply

Diversifying India's crops could provide better nutrition for 200 million undernourished people

December 4, 2019 Science Daily

India can sustainably enhance its food supply if its farmers plant less rice and more nutritious and environmentally-friendly crops, including finger millet, pearl millet, and sorghum, according to a new study from the Data Science Institute at Columbia University.

The study, published in the Proceedings of the National Academy of Sciences, finds that diversifying crop production in India, in this case replacing some rice -- India's main crop -- with millets and sorghum, would make the nation's food supply more nutritious while reducing irrigation demand, energy use, and greenhouse gas emissions. Such diversification of crops would also enhance India's climate resilience without reducing calorie production or requiring more land. "To make agriculture more sustainable, it's important that we think beyond just increasing food supply and also find solutions that can benefit nutrition,

farmers, and the environment. This study shows that there are real opportunities to do just that," says Kyle Davis, an environmental data scientist at the Data Science Institute at Columbia University and lead author of the study.

With nearly 200 million undernourished people in India as well as widespread groundwater depletion and the need to adapt to climate change, increasing the supply of nutri-cereals may be an important part of solving India's food shortage, Davis says. Historical practices, especially the Green Revolution, have promoted the use of high-yielding seed varieties, irrigation, fertilizers, and machinery and emphasized maximizing food calorie production often at the expense of nutritional and environmental considerations. But Davis assessed India's crops according to multiple indices. He and fellow researchers evaluated alternative production decisions across multiple objectives using India's rice-dominated monsoon grain production as a case study.

The team performed a series of optimizations to either maximize the production of important dietary nutrients (i.e., protein and iron), minimize greenhouse gas emissions and resource use (i.e., water and energy), or maximize resilience to

climate extremes. They found that planting more coarse cereals such as millets and sorghum could improve India's national food supply in myriad ways. On average, it would increase protein by 1 to 5 percent; increase iron supply by 5 to 49 percent; increase climate resilience (1 to 13 percent fewer calories lost during a drought), and reduce greenhouse gas emissions by 2 to 13 percent. The diversification of crops would also decrease the demand for irrigation water by 3 to 21 percent and reduce energy use by 2 to 12 percent while maintaining calorie production and using the same amount of cropland.

These findings show the many potential benefits of increasing millet and sorghum production in India, particularly in regions where rice yields are currently low, Davis says. "This work provides strong evidence that agriculture can be a powerful tool in helping to solve many of our planet's most important challenges, including malnutrition, climate change, and water scarcity."

The Indian Government is also promoting the increased production and consumption of nutri-cereals, which will be important for farmers' livelihoods and the increased cultural acceptability of these grains.

Expanding infant nutrition: Advanced Lipids launches two new formula ingredients mimicking human breast milk

02 Dec 2019 Nutrition Insight

Advanced Lipids, a joint venture of AAK and Frutarom, is launching two new additions to its Infat range of ingredients for infant formula.

Infat Pro offers higher levels of SN-2 palmitate, which are structured triglycerides that mimic the composition and the structure of human milk fat. SN-2 is already known to offer a range of benefits for babies, including longer sleep duration and reduced crying. Infat MF, on the other hand, presents a special blend containing milk fat. The new product launches mark the end of a “one-size-fits-all” approach in infant formula markets, according to the Sweden-headquartered manufacturer. “Infat Pro allows formula manufacturers to get even closer to the benefits of breast milk. It offers all the advantages of our original formulation but with even more SN-2 palmitate. This means fat, calcium and other essential nutrients can be better absorbed, supporting infant health and development,” explains Dr. Marcus Gliwitzki, CEO of Advanced Lipids.

Breastfed babies receive many of their nutritional needs from palmitic acid, the most common saturated fatty acid in humans. Seventy to 80 percent of palmitic acid in human breast milk is attached to the glycerol backbone in the SN-2 position, which facilitates calcium and fat absorption. However, in many oils used in formula, SN-2 concentration is as low as 8 to 10 percent. In a study, Advanced Lipids’ SN-2 infant formula



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ingredient Infat was found to have the potential to support healthy bone growth.

Infat notably already contains around 40 to 45

percent SN-2 palmitate, enabling formulas to more closely provide many of the benefits of breast milk. Research has shown that babies fed with formula containing Infat cry less and sleep more. Other benefits include greater comfort, supporting bone strength and supporting healthy gut bacteria. The new premium product, Infat Pro, offers even higher levels of SN-2 palmitate – as much as 60 percent – allowing better absorption of calcium and fat. “Infat Pro allows formula manufacturers to get even closer to the benefits of breast milk. It offers all the advantages of our original formulation but with even more SN-2 palmitate. This means fat, calcium and other essential nutrients can be better absorbed, supporting infant health and development,” notes Dr. Gliwitzki.

Advanced Lipids suggests that the “one-size-fits-all” approach no longer works in formula markets. Advanced Lipids is also introducing to market Infat MF, a special blend made with milk fat. Adding lipid components from milk to formula offers natural taste, and together with high SN-2, the product is designed to offer “the best of both worlds.” In addition to Infat, Infat Pro, and Infat MF, Advanced Lipids offers Infat Plus, which is designed to be closer to the structure of the breast milk of women from China. SN-2 palmitate is increasing in popularity in China’s infant formula market. Infant formula containing SN-2 palmitate accounted for almost 40 percent of the retail value of the US\$48 billion global formula market last year.

There have been some reports indicating that human milk

composition varies across different geographies and ethnicities. However, a Fonterra-led study focusing on women in the United Arab Emirates (UAE) found that their average concentrations of human milk oligosaccharides (HMOs), phospholipids (PLs) and gangliosides (GAs) were within the typical ranges reported for other ethnic cohorts. Notably, the researchers of the UAE study underscore that there are more similarities than differences for HMOs, PLs and GAs in human breast milk from different geographical locations and ethnicities. This suggests that each component has a specific biological and functional role linked to the timing of lactation.

In spite of these findings, Advanced Lipids suggests that the “one-size-fits-all” approach no longer works in formula markets. “It’s increasingly important for manufacturers to offer consumers a choice. We’ve worked hard to develop these innovative additions to our range and we’re delighted to have the chance to showcase them at Food Ingredients Europe (FiE),” says Ronald van der Knaap, Chairman of Advanced Lipids.

By Benjamin Ferrer

DNA technology “nudges” consumers to make personalized healthy shopping choices

The technology has been launched as a pop-up service in selected Waitrose and John Lewis stores in the UK

05 Dec 2019 Nutrition Insight

Tapping into personalized nutrition, genetic testing company DnaNudge has launched new pop-up services at supermarket chain Waitrose and department store John Lewis in the UK.

Image © iStock.com/LeoWolfert





and drink product barcodes to assess a product’s suitability based on consumers’ personal genetic profile. With the app, the camera becomes a barcode reader, facilitating healthy shopping based on DNA. It recommends alternative product swaps in the same category that would be more healthy based on a person’s unique DNA.

With a touch of an app, consumers can make better informed dietary choices based on their own DNA. Similarly, the DnaBand flashes green if a product is a good match for a person’s DNA and red if it isn’t. It also features a physical inactivity monitor, which glows amber when the user has been

one’s risk of Type 2 diabetes,” says Dr. Maria Karvela, Co-Founder and Chief Scientific Officer at DnaNudge.

Toumazou emphasizes that this new wave of technology is not only inspired by genetics, lifestyle and health care, but more importantly, behavior. “Everyone needs to be ‘nudged’ differently. After a while, you educate yourself and you then know what is good or bad for you,” says Toumazou. Consumers seek decision-making facilitators at the point of use, without having to wait and worry about physicians’ undecipherable results, he adds.

In the future, DnaNudge is keen on

Shoppers can take a quick, on-site cheek swab to generate a personalized DNA report revealing key nutrition-related health traits. DnaNudge’s technology is the first in-store genetic test that “nudges” shoppers to make healthier choices and to get sufficient physical exercise, all provided by DNA technology.

“Retailers have an important role to play in helping shoppers who want to be healthier, so we are pleased to be teaming up with DnaNudge to offer this new technology which enables customers to make more informed choices based on the dietary aspect of their DNA,” Moira Howie, Nutrition and Health Manager at Waitrose & Partners, tells NutritionInsight. “We’re excited to be working in partnership with Waitrose and John Lewis to deliver our DnaNudge service to customers in these stores. These new pop-ups bring our ‘Shop with your DNA’ technology and ‘Eat right, move more’ message for healthier food choices direct to Waitrose and John Lewis customers,” says Professor Chris Toumazou, Regius Professor of Engineering at Imperial College London and CEO and Co-Founder of DnaNudge.

Once tested in the stores, shoppers can begin using the DnaNudge smartphone app or a wrist-worn DnaBand to scan over 500,000 food



inactive for too long during the day. A lack of physical activity changes the user’s product recommendations in the app – something that was green may show as amber and to get back to green, you need to exercise.

Personalized nutrition trending While retailers play an important role in helping shoppers become healthier, this DNA-personalized service offers solutions to the health issues consumers face, all while respecting their privacy. “We all want personalization in every choice we make. The best way is by using your DNA. Even just switching out one type of cereal for a lower sugar alternative can reduce

extending its DNA-personalized services into other areas over the coming months. The use of technology to personalize nutrition has been booming, as seen in products such as FoodMarbleAire, a portable breath test and app to measure and track digestive health. Meanwhile, Seed Health and Atmo Biosciences recently announced a collaboration on an ingestible gas-sensing capsule technology monitor key gases produced within the gut in real-time. To keep track of innovation within personalized nutrition, five organizations came together to form the American Nutrition Association (ANA). By AnniSchleicher



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Cheaper, more efficient alternative to traditional sugar: Researchers unlock improved tagatose production

05 Dec 2019 Nutrition Insight

Researchers from Tufts University, US, have developed a process that may unlock the commercial potential of tagatose, a low-calorie, low-glycemic sugar.

By using bacteria as tiny bioreactors that encapsulate the enzymes and reactants, the scientists were able to increase yields from 30 to 85 percent, which they say could lead to large-scale manufacturing and getting tagatose on every supermarket shelf. The US Food and Drug Administration (FDA)-approved natural sugar has only 38 percent of the calories of traditional table sugar, is safe for diabetics and does not cause cavities, meaning it could be a key tool in reformulation targets. "Although other commercial syntheses of tagatose are available, they result in a supply priced at about US\$35 per pound, which is very expensive. It is hoped that this method of synthesis could bring that price down significantly, making it more widely available," Mike Silver, Associate Director of Public Relations at Tufts, tells NutritionInsight.

While tagatose is derived from fruits and dairy products, it is not abundant and can be difficult to extract. The current manufacturing process involves a conversion from more easily obtained galactose to tagatose and is highly inefficient. Thanks to its good browning ability, tagatose is very suitable for baking purposes, where a caramelized flavor is desirable. Additionally, Silver hopes that its natural taste

could give it an edge over artificial sweeteners. "It only slightly raises the level of glucose in the blood after ingesting, with a glycemic index of 3, in comparison to 99 for conventional sugar." However, the method has not yet been developed to commercial scale, and the scientists have not pursued a patent for their system. "There is always room to improve processes. Although this is the most productive system compared to other published studies, it is still quite slow, so we can improve rates and productivity. Higher conversions – up to 100 percent – would be even more desirable," says Nikhil U. Nair, Assistant Professor in Chemical & Biological Engineering at Tufts and who partook in devising the system. The team is now interested in exploring if a similar approach can be used to address issues with other hard-to-make sugars. An innovative method

Now published in Nature Communications, Nair and postdoctoral fellow Josef Bober used *Lactobacillus plantarum* – a food-safe bacterium – to make large quantities of an enzyme called L-arabinose isomerase (LAI), which makes tagatose from galactose. As galactose is not the main target for the enzyme, the rates and yields of the reaction with galactose are less than optimal. Additionally, LAI is not very stable in a solution, and the reaction can only push forward until about 39 percent of the sugar is converted to tagatose at 37 °C, and only up to 16 percent at 50 °C before the enzyme begins to degrade.

However, *L. plantarum* can keep LAI safe and stable within the confines of the bacterial cell wall. The researcher found that when expressed in *L. plantarum*, the enzyme kept converting galactose to tagatose and pushed the yield to 47 percent at 37 °C. With LAI stabilized within the cell, it increases the yield to 83 percent at the higher temperature of 50 °C without

degrading significantly, while producing tagatose at a much faster rate

The researchers also found evidence that the transport of the starting material, galactose, into the cell was a limiting factor to speed. To resolve that issue, they treated the bacteria with just enough detergents to make their cell walls leaky. The galactose was able to get in and tagatose released from the cells, allowing the enzyme to convert galactose to tagatose at a faster rate, shaving a couple of hours off the time needed to get to 85 percent yield at 50 °C. Nair notes that the team is now interested in exploring if a similar approach can be used to address issues with other hard-to-make sugars that are of interest. This comes at a key time as the industry is facing increased reformulation pressure. Earlier this week, it was found that that one in four UK festive hot drinks had more sugar than directly comparable hot beverages, while dairy alternatives harbored excess sugar to just as great an extent. Action on Sugar is now calling for the highly successful Soft Drink Industry Levy (SDIL) to be extended to sugary-milk based drinks.

By Katherine Durrell

Future food: The market for algal oil is brimming with potential for future innovation, say experts

10 Dec 2019 Nutrition Insight

What is the future of food? This question has perhaps never been more relevant than now, as climate change chaos has ensnared the global population.

Permeating these chaotic times are vital questions about feeding a growing population nutritiously, while being respectful to the environment.



Image © iStock.com/greenleaf123

In particular, this prompts concerns over the sourcing and cultivation of our ingredients. One key ingredient in this space may be algae. This article can be read in full in the October/November edition of *The World of Food Ingredients*. From creating flood and drought-resistant crops to increasing crop yield through space-saving vertical farming, today's brightest minds in the fields of science are seeking to transform our food system – and with very good reason. The traditional global food systems (especially in agriculture) are typically based on high production levels with little focus on long-term consequences. Trading this for a less linear, more nature-based, sustainable model includes searching for sources of proteins and omega which don't come from animals. The ocean may hold some potential in this space in the form of its underwater forest – algae. Primarily, the term “algae” encompasses a group of organisms that are capable of producing oxygen through photosynthesis, including microalgae. Beyond this, algae can be quite diverse but largely exist as single, microscopic cells and can live in both seawater and freshwater. Algae was even pegged as the “food of the millennium” by the Food and Agriculture Organization of the United Nations (FAO). As the world population expands to reach almost 10 billion by 2050, so does the appetite and demand for high-protein, high-omega sources and investment in algae is streaming in by the billions.

A strong nutritional profile

Some algae, particularly blue-green and green variations, boast a very high level of protein. They also have high nutritional value in terms of their omega profile. The ocean may hold some potential in the alternative space in the form of its underwater forest – algae. Fish and krill obtain their omega 3 from the marine algae they feed on, so, being the original source of omega 3 for fish, algae deliver eicosapentaenoic

and docosahexaenoic acids (EPA and DHA) extremely efficiently, notes Maja Orešnik, S&R Director, PharmaLinea. “Microalgae have the highest content of proteins on the planet (it can be up to 60 percent), including all essential amino acids, as well as polyunsaturated fatty acids (original source of omega 3), vitamins, polysaccharides, carotenoids and other substances highly beneficial to human health,” says Raschid Stoffel, Head of Food and Beverage at AlgaEnergy. As such, algae ingredients are undergoing significant growth in the dietary supplements and food and beverage sectors. This is particularly as consumers become more aware of plant-based sources of the coveted omega 3 fatty acids, EPA and DHA. This is according to a DSM spokesperson, who also notes that with over 30,000 clinical studies and research papers on the subject, EPA and DHA are well-established nutrients. Tapping into a range of health areas including cognitive, cardiovascular and infant and senior health, they can answer consumer calls for effective, multi-benefit solutions.

Reached the mainstream?

Omega 3 has now certainly reached the mainstream, speculates Dr. Christopher Studte, Director of New Health Ingredients at Evonik. “Studies continue to suggest that many consumer segments, including the elderly and young adults, are not only aware of omega 3 but highly positive about its health benefits. Indeed, many consumers now consider omega 3 to be a standard supplement, like we think about multivitamins.” Research has also abounded on the health benefits of the ingredient. Among the long-awaited findings of the VITamin D and Omega-3 TriaL (VITAL) study was the fact that Omega 3 fatty acids can aid in reducing the risk of heart attacks, especially among African Americans. The VITAL trial is being conducted at Brigham and Women's Hospital, an affiliate of Harvard Medical School, in

Boston, Massachusetts. This has translated to market, according to Philippe Lavielle, CEO at Fermentalg. He notes that the market for algae being used for omega is worth over US\$1.5 billion and has already grown by 5 percent this year. “There are two main drivers for this growth: healthy nutrition: finding the right balance between eating better (clean label, organic), and environmental consciousness: eating more responsibly (less meat, flexitarian eating). Microalgae provide the right balance and a scalable solution to the vast protein shortage forecasted by 2030,” he explains. A DSM spokesperson also adds a third driver to the increasing popularity of algal omega 3 solutions: developing concerns about environmental contaminants which are sometimes found in non-algal sources of omega 3 oils. The market for algae being used for omega is worth over US\$1.5 billion and has already grown by 5 percent this year. This is significant as, according to research by DSM, over 70 percent of the global population make purchasing decisions based on “naturalness” when considering a packaged food and beverage product, while 40 percent believe it is important when buying dietary supplements.

Environmental pressure

Generally, a higher consumption of animal-based foods is associated with a higher estimated environmental impact, whereas increased plant-based food consumption is associated with a lower environmental impact. Indeed, the global population's consumption of omega 3s has put increasing pressure on the marine ecosystem and fish and krill stocks within that ecosystem. According to FAO, a growing human population is expected to drive an increase in fish consumption of approximately 1.2 percent per annum over the next decade. Production of fish and fish products is estimated to reach over 200 million tons by 2030. FAO has previously spotlighted how the

world is off-track to meet most of the Sustainable Development Goal (SDG) targets linked to hunger, food security and nutrition. Within this, it noted that one-third of the world's marine fish stocks are overfished today, compared to only 10 percent in 1974. The DSM spokesperson further underscores that the conservation of marine life is "under peril due to overfishing." In light of such overfishing concerns, algae cultivation at mass level could significantly reduce pressure and "fish-in-fish-out" (FIFO) ratios. This ratio measures the amount of fish meal and fish oil that is used to produce one weight equivalent of farmed fish back to wild fish weight equivalents. For many organizations, FIFO is regarded as a benchmark of progress in relation to environmental performance. "Algae omega 3s will replace the need for intensive fishing, it is just a matter of time. This is unless the fish stocks collapse in the meantime due to overfishing and climate change," notes Lavielle of Fermentalg. Luckily, besides its robust nutritional profile, algae can be easy to cultivate at high mass – with little environmental degradation. "Its use helps to conserve biodiversity in the oceans, enabling the continued sustainable growth of aquaculture within planetary boundaries," explains the DSM spokesperson.

An investment splash

The market for algal oil is dynamic, with plenty of opportunities for future innovation. As aquaculture brims with potential, large players such as DSM, Evonik, ADM and Cargill are already jumping aboard. In light of overfishing concerns, algae cultivation at mass level could significantly reduce pressure and "fish-in-fish-out" (FIFO) ratios. Specialized nutrition within aquaculture also touts a broad innovation space, explains Lavielle. Fewer players are active here, but among the ones that are, Fermentalg is leading with its strong focus on proteins and lipids. The company has also invested over €70 million

(US\$76.5 million) in building its technology and industrial platforms. Fermentalg's DHA Origins is touted as the "first DHA algal oil with a natural minimum concentration of 550mg/g." Last September, a few months after the oil's launch, the company entered into an initial contract with DSM Nutritional Products. According to the terms of this five-year agreement, DSM will buy DHA Origins 550 and market it worldwide. DSM is another global player that has upped its engagement with algae. DSM and Evonik announced a 50:50 joint venture (JV), Veramaris, in July. Veramaris produces omega 3 fatty acids, EPA and DHA, from natural marine algae, produced through industrial-scale land-based fermentation.

Consumer-facing NPD

DSM enforces that it is "continually investing in R&D in this segment, developing solutions and ingredients to meet growing consumer demand, as well as new processing and refining technologies." The company has just launched an oil which is unique in the market, coined life's OMEGA. It contains 150mg of EPA and 300mg of DHA, as well as being offered in a vegetarian capsule. As the fastest growing product in DSM's algal oil portfolio, the company is also working on the next generation of this product with even higher levels of EPA.

As aforementioned, consumers increasingly value naturalness in supplements or health products. In this way, products that tout an ultra-high concentration with properties increasingly required by the markets – such as sustainable sourcing from microalgae and extraction without solvents – will appeal. French marine lipid expert Polaris launched a "super-concentrated, ultra-purified" algal omega 3 oil, which gained European authorization in September. The product is also subjected to a purification process that increases the level of healthy

polyunsaturated fatty acids, notes the company. This results in the product having a low saturated fatty acid content – around 5 percent compared to 30 percent or higher in other algal DHA oils. It is also stable due to Polaris' patented QualitySilver 5 technology, which helps protect the nutritional profile of the oil and increases its resistance to oxidative stress.

"Algal sources of omega 3 meet the growing demand for plant-based products, they're allergen-free, suitable for vegetarians and vegans, and they come from a source that can be managed in an environmentally friendly way. Furthermore, fishy taste and smell – which deter many consumers – are not an issue," says Louis-Marie Martin, VP of Sales & Marketing at Polaris.

By Laxmi Haigh, for The World of Food Ingredients

Image © iStock.com/rostovtsevayulia



FAO partnership promotes pulse production and consumption to tackle global malnutrition

11 Dec 2019 Nutrition Insight

The cultivation of pulses could address a range of malnutrition needs around the globe.

This is according to the Food and Agriculture Organization of the United Nations (FAO), which is embarking on a three-year partnership with the Global Pulse Confederation (GPC) to promote the cultivation of crops including lentils, dry beans, dry peas and chickpeas.

This is in light of the gap between potential and actual yields continuing to affect many smallholder farms. The new partnership aims to move from advocacy to on-the-ground actions, including spurring investment opportunities and mapping out ways to leverage value chains for products. “Pulses are increasingly seen as a key part of healthy diets and consumers are looking for healthier alternatives to foods of animal origin. Pulses are useful especially in addressing protein-energy malnutrition. They can also help with obesity, diabetes and coronary heart diseases,” Boubaker Ben-Belhassen, Director, Trade and Markets Division at FAO, tells NutritionInsight.

The health benefits of a pulse-rich diet has fueled the demand for alternative sources of proteins and pulses seem to be the most common alternative, he continues. For example, pulses are a key component in recently popularized foods, such as meatless burgers. Pulses are a subgroup of legume crops harvested for dried grains. These include lentils, chickpeas, dry beans, pigeon peas and other species. Low in fat and sodium, pulses are naturally free from both cholesterol and gluten, while delivering high amounts of fiber, folate, potassium and plant-based protein and iron. Pulses also provide a strong basis for healthy, daily nutrition and can be used in a wide variety of derivative products, such as pasta, noodles and enriched flour, Ben-Belhassen notes. “Given the multiple benefits of pulses, their consumption should be promoted. Encouraging pulse consumption requires a multifaceted approach that should be adapted to different socio-economic realities. Making pulses more accessible and attractive, responding to the expectations of consumers and tackling new trends are important elements of the approach,” he states. Trends in consumption of pulses across different regions, 1985

to 2010. Pulses have also been spotlighted for their sustainable profile. In October, a study tied the health impacts of foods to their overall environmental impact, such as greenhouse gas emissions (GHG) and water usage. The results show that healthier diets, consisting of pulses and vegetables, for example, would markedly reduce the environmental impact of agriculture and food production.

Malnutrition and food insecurity

As malnutrition stems from unbalanced or unhealthy diets, it is one of the major contributors to obesity, diabetes and coronary heart diseases and can even lead to death. Rates of malnutrition are concerning in many parts of the globe, as a recent study found that Sub-Saharan African families are at greater risk of food security than previously estimated. Pulses are consumed in much higher levels in Latin America, South Asia and sub-Saharan Africa, given their cheaper availability compared with animal-based foods, says Ben-Belhassen. However, this is offset by much lower levels in the rest of Asia, Europe and Oceania, according to The Global Economy of Pulses, a report published by FAO earlier this year. Due to a shift toward foods of animal origin as a source of protein in the diet, this price advantage has been diminishing over the years. Other contributing factors to the high intake include household economies, regional cultures, dietary preferences and levels of awareness. The FAO’s partnership with GPC aims to bring this dietary importance back to the fore by boosting the visibility of World Pulses Day – February 10 – around the world, with the GPC using its networks to encourage greater private-sector participation. This follows momentum gained from 2016’s UN International Year of Pulse, which helped legumes and pulses gain momentum.

The bean of our existence

Certain practical obstacles prevent

pulse foods’ market expansion. Ben-Belhassen names stagnant demand, low productivity, low R&D investment for pulse crop as well as government policies as four factors restricting pulses from popularly returning to the market.

The availability of non-regional products has led people to abandon their traditional diets and rising incomes have led people to shift to animal-based food. This leaves global consumption of pulses stagnant at around 7 kg per person annually, Ben-Belhassen says. Pulse crops suffer from a lack of interest by governments and policymakers. Source: FAO/ChristenaDowsett. On the production front, pulse cultivation on smallholder farms is characterized by low yields and high risk, he continues. Given the low and uncertain returns from pulses, most smallholder production takes place on marginal soils, on land without irrigation facilities and with limited access to technological improvements. The FAO-GPC partnership is set to identify at least three investment opportunities involving at least 1,000 smallholders each and pitching the plan to potential investors.

Pulse crops suffer from a lack of interest by governments and policymakers, as pulse cultivation is not viewed as an activity capable of generating economic returns, Ben-Belhassen says. “This has translated to a low level of R&D investment for these crops. A review of the state of pulse research showed that out of an estimated total budget of US\$61 billion of public and private food and agricultural research annually, only some US\$175 million (less than 0.3 percent) were directed towards pulse crops.” Moreover, in developing countries, the main priority of governments has been to increase cereal production, especially wheat and rice, for food security purposes, he says. This has constituted a “policy bias” against smaller crops. Addressing these concerns, FAO will conduct

value-chain analyses in selected countries, while the GPC will analyze the discovered opportunities and propose business plans to investors and donors. FAO also aims to channel its expertise to de-risk private-sector investment opportunities in agri-food systems and value chains of developing countries by conducting assessments and research and facilitating public-private policy dialogue.

By AnniSchleicher

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unpict



Humanizing food may help reduce food waste

IFTNEXT November 13, 2019

Here is a shameful statistic: A little more than 1 billion tons of food is wasted every year around the world.

Researchers are working to find ways to reduce the staggering amounts of wasted food, and one of the latest studies on the topic suggests that thinking of fresh produce in terms of human traits may help.

This humanizing of food may help people look at fruits and vegetables that are a little less than fresh or imperfect in a different way. “We suggest that when old produce is humanized, it is evaluated more favorably, since it leads consumers to evaluate the old product with a more compassionate lens,” write the researchers, who are from University of Illinois at Urbana-Champaign and University of Houston. A couple of the ways that

the researchers anthropomorphized produce that was slightly past its prime in images was to show a banana lounging in a chaise and arranging cucumber slices in a way to show a human face. Subjects rated these types of images more favorably than images of produce that was not anthropomorphized.

The researchers suggest that store managers and food marketers could adopt a similar format to showcase produce that may look less than perfect but is otherwise nutritious and safe. They published their study in *Journal of the Association for Consumer Research*.

Developing more flood-resistant crops

Of the major food crops, only rice is currently able to survive flooding. Thanks to new research, that could soon change—good news for regions of the world where rains are increasing in both frequency and intensity.

IFTNEXT November 18, 2019

Of the major food crops, only rice is currently able to survive flooding. Thanks to new research, that could soon change—good news for regions of the world where rains are increasing in both frequency and intensity.

The research, published in *Science*, studied how other crops compare to rice when submerged in water. It found that the plants—a wild-growing tomato, a tomato used for farming, and a plant similar to alfalfa—all share at least 68 families of genes in common that are activated in response to flooding. Rice was domesticated from wild species that grew in tropical regions, where it adapted to endure monsoons and waterlogging. Some of the genes involved in that adaptation exist in the other plants but have not evolved to switch on when the roots are being flooded.



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Oleh_Slobodeniuk

In the study, the team examined cells that reside at the tips of roots of the plant, as roots are the first responders to a flood. Root tips and shoot buds are also where a plant's prime growing potential resides. These regions contain cells that can help a plant become more resilient to flooding. Drilling down even further, the team looked at the genes in these root tip cells to understand whether and how their genes were activated when covered with water and deprived of oxygen. The genes involved in flooding adaptations are called submergence up-regulated families (SURFs). The researchers found that the plants had 68 SURFs in common with rice, which was surprising given that 180 million years of evolution has taken place.

While UC Riverside researchers conducted flooding experiments and analysis of rice plant genomes, scientists at Davis did the same with the tomato species while the alfalfa-type plant work was done at Emory. Though the SURFs were activated in all the plants during the flooding experiments, their genetic responses weren't as effective as in rice. The wild tomato species that grows in desert soil withered and died when flooded. Climate change also produces periods of excessive drought, and separate efforts are under way to examine crop resilience to those conditions as well.



Image © iStock.com/Silvia Jansen

However, Bailey-Serres said flooding responses are understudied compared to drought, making this work even more important. The group is now planning additional studies to improve the survival rates of the plants that currently die and rot from excess water.

Asia needs \$800 billion investment to meet growing food demand

IFT DAILY NEWS November 20, 2019

A report produced by consultancy PwC, Rabobank, and Singapore state investor Temasek finds that Asia's food and agriculture industry needs investment of \$800 billion over the next 10 years to meet the region's growing food demand.

Most of these investments—around \$550 billion—will enable key requirements around sustainability, safety, health, and convenience. The remaining \$250 billion will drive increased quantities of food to feed Asia's growing population, according to The Asia Food Challenge Report: Harvesting the Future. Together, the investments will unlock market growth of around 7% per year, with the region more than doubling its total spend on food to over \$8 trillion by 2030. The report's authors see this as a huge opportunity for corporations and investors to invest in Asia's agri-food industry by placing a stronger focus on promising high-impact innovations. "Asia needs innovation and technology to transform its agri-food system into one that is ecologically and economically

sustainable," said Ping Chew, head of RaboResearch, Food & Agribusiness, Asia, Rabobank. "Only through working together with shared responsibility and acting now can Asia feed itself while preserving the planet for future generations. Innovating for sustainability can also bring about value creation, and there are huge opportunities shifting into a more sustainable model that can tackle waste and supply chain inefficiency, produce higher yields, create platforms to connect, and introduce new products and processes."

The report identifies technology as a critical enabler in meeting these shifting demands, which will require significant investments across the industry. Currently, Asia's agriculture-food sector is lagging behind other regions, particularly North America and Western Europe, due in part to the sheer diversity of countries, their varying levels of economic development, and regulatory systems. To overcome these challenges, the report finds that greater collaboration and shared responsibility between the public and private sectors in the region must be established. This involves stronger backing from governments in terms of policies and legislations that support new technologies and innovations, as well as the formation of corporate venture capital teams and incubators. Several Asian cities, such as Beijing, Hong Kong, Mumbai, Singapore, and Tokyo, have the potential to become agriculture-food innovation hubs. Key criteria for success, including positive regulatory environments for startups and investment, technical expertise, talent, and a strong pool of investors, can be found in these cities.



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Technology extends the shelf life of apples

IIFTNEXT November 20, 2019

Fruits and vegetables pack lots of nutrition. But more than half of the produce harvested never makes it to consumers due to pests, plant diseases, and improper storage.

Researchers from the Institute of Environmental Biotechnology at TU Graz in cooperation with the Austrian Centre of Industrial Biotechnology and industrial partners have successfully tested ecological methods (i.e., hot water treatment [HWT] and biocontrol organisms) that improve the storage of apples and extend their shelf life, according to a press release. In a study published in the journal *Frontiers in Microbiology*, researchers from the Institute of Environmental Biotechnology at TU Graz successfully tested a method that significantly improves the shelf life of organic apples through the combined use of HWT and biocontrol organisms. "We infected organic apples with two of the most important putrefactive agents, then treated them with hot water and a biocontrol agent designed by us," says researcher and PhD student Birgit Wassermann in the press release. "This combined approach enabled us to either kill the postharvest pathogens completely or to reduce the infection diameter to a maximum in about 60% of the apples treated in this way."

Image © iStock.com/narith_2527



The researchers conclude in the study that, "HWT-induced plant response diminished pathogen infection at industrial scale and showed an impact on the fungal composition. We suggest that the apple fruit is protected by either HWT or the inherent microbiome; however, presumable it is the combination of both, mediating disease resistance. Small-scale storage experiments applying HWT together with biological control agents provide further confirmation of the considerable potential of combining methods into one control strategy to reduce postharvest decay of apples. Moreover, harnessing the indigenous microbiota of fruits for a biological control approach is a promising and sustainable future strategy to prevent postharvest decay of fresh and stored produce."

Waters with protein without protein flavor?

Food News LATAM
NOVEMBER 12, 2019

A new exclusive product from Arla Foods Ingredients overcomes problems of taste and mouthfeel that have long been a challenge for producers of clear protein waters.

The tendency to high protein content, the demand for convenient and ready-to-drink nutritional drinks and the success of the sports nutrition category have encouraged consumer interest in clear protein waters. However, some brands have been reluctant to launch new products due to the challenges posed by the taste and dry mouth. Lacprodan® ISO.Water is a 100% whey isolated protein ingredient that overcomes these problems. Designed especially for clear drinks, it provides an excellent mouthfeel without protein flavor, creating new

opportunities for innovative products with a unique flavor. Arla Foods Ingredients will present the new product at Stand 6C120 at Food Ingredients Europe (December 3-5 in Paris).

Troels Laursen, Director of Nutrition for Performance and Health at Arla Foods Ingredients, commented: "Protein waters are a fantastic way to offer consumers healthy protein in a convenient, refreshing and low-calorie format. However, previously they couldn't provide excellent flavor. Lacprodan® ISO. Water overcomes this challenge and paves the way for

products with a much wider range of flavors. It will set a new standard for clear protein waters with excellent flavor and that also cover nutritional needs."

Lacprodan® ISO. Water is ideal for

ready-to-drink protein drinks. Made in Europe, it is a product without sugar*, without fat*, without lactose** and without GMO; In addition, it is Halal and Kosher. Other Arla Foods Ingredients products to be displayed at Food Ingredients Europe include Lacprodan® HYDRO. PowerPro, which offers all the sports nutrition benefits of whey protein hydrolyzate without the bitter taste. In blind sensory evaluations, it was shown to be 50% less bitter than other comparable products with similar degrees of hydrolysis.



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World spicy food trends

VANESSA II MICOLUCCI, Food News
LATAM, NOVEMBER 12, 2019

Kalsec, a leading global producer of high-quality natural color and flavor extracts for the food and beverage industry, launched its latest research that tracks global trends in hot and spicy foods.

The 2019 Spicy Perceptions eBook captures global consumer trends, sensory research and market product analysis as part of Kalsec's ongoing commitment to provide leading spicy management products. "As consumer trends develop and the desire for more specialized peppers grows, Kalsec remains dedicated to leading the space of spicy flavors through continuous research and innovation," said Jill McKeague, Executive Director, Product Management, Spice and Herb Flavor Extracts. "We are excited to share the results of our 2019 research that expanded to track global and regional preferences for spicy foods, overlaid with product analysis."

The enjoyment of hot and spicy foods is at an all time high, with 95% of global consumers reporting that they enjoy foods with a mild or higher heat level. The Kalsec's 2019 Spicy Perceptions eBook offers an in-depth view of the preferences of spicy food consumers worldwide and offers important information for product innovation. Regional differences occur in the desire for spicy foods and the perceived definition of itching levels.

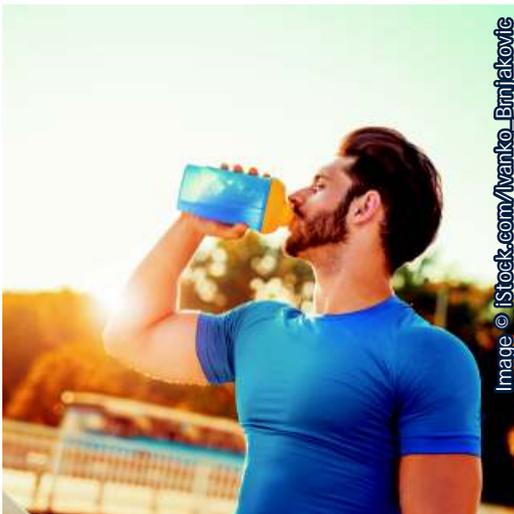


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The perception of thermal acidity varies throughout the world. The research found that the Asia-Pacific region has the highest tolerance to spiciness, followed by America and Europe. While consumers in the Asia-Pacific region eat the most spicy foods, consumers in the Americas are more interested in trying new spicy flavors.

Consumers feel more comfortable trying new spicy flavors in family salty foods. More than 60% of consumers surveyed agree that tasty foods taste better with a certain level of spice. Consumers are also more likely to favor their own cuisine when it comes to trying spicy foods, and prefer to try spicy items as a main course or main course.

However, changes in how and where consumers enjoy spicy foods are evident in different demographic groups. The research found that 48% of consumers are interested in trying combinations of spicy and sweet flavors, while 39% of consumers are interested in spicy and spicy combinations.

Additional information and information are available in the Kalsec 2019 Spicy Perceptions eBook available for download: <https://info.kalsec.com/download-spicy-food-trends>.

As an industry leader in spicy management solutions, Kalsec has been tracking consumer perceptions and trends related to spicy foods since 2007. His 2019 research was conducted through online surveys in Australia, Brazil, Canada, China, France, Germany, India, Italy, Mexico, Thailand, United Kingdom and the United States with 500 consumers from each country.

The market product analysis analyzed spicy food products from

Australia, Canada, China, Germany, India, Italy, Thailand, the United Kingdom and the United States to assess the level of spicity, as measured by the main capsaicinoids (MC). The sensory analysis was performed by Kalsec's professionally trained panel.

Novel nonthermal approach controls pathogens in flour

IFTNEXT | ARTICLE November 6, 2019

Flour may not be the first product that comes to mind when you think foodborne illness, but the threat of flour contamination by pathogens such as *E. coli* and *Salmonella* is real.

Concerns about the presence of pathogens prompted a number of flour recalls in 2019, including recalls of products sold under such well-known labels as Pillsbury and King Arthur. A Toronto-based company called Agri-Neo has announced the availability of an organic, nonthermal technology designed to achieve microbial reduction greater than 99.9% in flour.

The novel new technology, which is called Neo-Temper, offers millers an alternative to heat treatment of flour. Heat treatment is not considered an optimal approach because of its cost and the fact that

it adds extra steps to the milling process and can degrade the quality of flour.

With Neo-Temper, an organic liquid solution is mixed with water deployed during the tempering process of flour milling. This technique destroys pathogens on the surface of wheat kernels and in cracks and crevices that may harbor pathogens.

Because the process does not use heat, it preserves flour's nutritional content and functionality. In addition, the liquid solution later biodegrades, which means that it is considered a processing aid by regulators, and no product labeling is required.

"Flour is a top three food staple in our daily lives, yet to date the industry has not had a commercially viable solution to address the recurring number of flour recalls we are seeing due to *E. coli* and *Salmonella* contamination within this highly consumed ingredient," says Rob Wong, president of Agri-Neo.

The company has completed four commercial validations of Neo-Temper in flour mills in the United States and Canada and reports that it has a waiting list of North American companies interested in utilizing the process.





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topthailand

Study looks at reducing sodium intake through MSG substitution in saltiest food categories

By Mary Ellen Shoup 08-Nov-2019 -
Food Navigator USA

As approximately 90% of Americans struggle with keeping their sodium intake in check, new research suggests that glutamates such as monosodium glutamate (MSG) can be used to reduce sodium in the food supply by 7% to 8%.

The study, published in the journal *Nutrients* - and funded by Ajinomoto, which manufactures yeast extract, MSG, and umami seasonings - indicates that if glutamate was used as a salt substitution in products such as cured meats, meat-based frozen meals, soups, and crackers food categories that contain the highest amounts of sodium most everyone in the US over the age of one would likely benefit from a reduction in sodium.

Americans eat on average about 3,400 mg of sodium per day. However, the Dietary Guidelines for Americans recommend limiting sodium intake to less than 2,300 mg per day. "A considerable number of studies have demonstrated that various forms of glutamate can help reduce the amount of sodium in specific foods, including soups, prepared dishes, processed meat, and dairy products, by enhancing palatability," wrote researchers. "However, much less is known about how glutamate substitution

would affect sodium intakes at the population level across a range of different foods."

Replacing sodium poses technical challenges given its role in palatability and food safety (e.g. preventing bacterial growth and spoilage), but glutamate is a way for food developers to partially replace sodium without sacrificing taste, according to the study. "Currently, no perfectly viable alternative for replacing sodium exists in the contemporary food marketplace, although several innovations do exist among various product categories. For example, glutamate, a nonessential amino acid, has been used to enhance the taste and palatability of food," researchers noted.

"Glutamates, such as MSG, represent a potential strategy to reduce overall intakes while preserving product palatability... this project aimed to model sodium replacement with glutamates. Most of our sodium intake comes from restaurant meals and packaged foods," said Dr. Taylor C. Wallace, an adjunct professor in the Department of Nutrition and Food Studies at George Mason University and lead researcher in the study.

"MSG can be used to reduce sodium in these foods without a taste trade-off. MSG contains about 12% sodium, which is two-thirds less than that contained in table salt, and data shows a 25-40% reduction in sodium is possible in specific product categories when MSG is substituted for some salt. As Americans begin to understand that MSG is completely safe, I think we'll see a shift toward using the ingredient as a replacement for some salt to improve health outcomes."

Small reduction in sodium could have large public health pay-off
Researchers used the data set

from those enrolled in NHANES (National Health and Nutrition Examination Survey) between 2013-2016, which includes 16,183 subjects aged 1 year and older.

They established average sodium consumption and then used a modeling method to estimate sodium reduction using glutamate in food categories containing the most salt (e.g. cured meats, which 18.7% of US adults consume on a given day).

Regardless of age, men had higher sodium intakes than women. Specifically, among adults (=19 years), men typically consumed approximately 4067 mg sodium/day, whereas women consumed approximately 2956 mg sodium/day. Similar sodium consumption trends emerged among children (1-18 years) where boys had higher mean sodium intakes than girls (3268 versus 2673 mg/day, respectively).

Among children, the top three contributors to total sodium intakes are crackers and salty snacks, cured meats, and select cheeses. For the total population, they found that the substitution of glutamate in certain food categories can reduce sodium intake by approximately 3%, and among consumers of at least one product category that is typically higher in sodium (like cured meats), the addition of glutamate could reduce sodium intake by even more (7-8%). "While reducing the amount of sodium among certain food groups may show modest effects on intakes across the adult population, it may have a large effect on those who consume those types of products," researchers concluded.



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REGULATORY NEWS

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The Netherlands to roll out Nutri-Score: One in two Dutch people overweight, research warns

02 Dec 2019 Nutrition Insight

The Dutch government is set to implement the Nutri-Score food labeling system to its food products by mid-2021, according to the Dutch National Institute for Health and Environment (RIVM).

The move seeks to address a rising overweight epidemic, as Dutch research estimates that one in two Dutch people are currently carrying excess weight. Meanwhile, Dutch government-endorsed consumer research tested three European food labeling logos – Nutri-Score, Keyhole and the Multiple Traffic Light system. The results showed that Nutri-Score best helped consumers make healthier food choices. By implementing Nutri-Score, the Dutch government aims to join the movement toward healthier dietary decision making.

“It has always been our commitment to make healthier choices easier and now, we are taking a major step in that direction. Research has shown that the Nutri-Score logo helps consumers best to make healthier choices,” explains Paul Blokhuis, State Secretary of Health, Welfare and Sport. This is especially important given the Netherlands imports and exports a lot of food products, he states. Lacking weight management, being overweight and obesity are rising global concerns that has been linked to several adverse health outcomes, such as diabetes and cardiovascular diseases (CVDs). The Netherlands is the most recent in a string of countries to take steps to combat the

issue. The traffic-light labeling system is set to roll out in the Netherlands in mid-2021. Commissioned by Blokhuis himself, the Dutch government researched three different labeling systems, namely the Scandinavian Keyhole, the British Multiple traffic light and the French Nutri-Score systems. Its results revealed that the Nutri-Score system helped lead study participants to make the healthiest dietary choice.

Using Nutri-Score, the Netherlands aims to join the movement toward healthier dietary decision making. Additionally, Nutri-Score is currently receiving international prominence, Blokhuis affirms. He highlights that the logo came out best in consumer research in Germany. France, Belgium and Switzerland have all opted for Nutri-Score for their food labeling, with Spain having spearheaded the initiative. Blokhuis specifies in a letter addressing the Dutch Lower House that use of this logo from Dutch food producers is not permitted under current legislation. However, producers from neighboring countries who have already legally introduced the labeling system may feature Nutri-Score on their products. Indeed, food giant Nestlé also has plans to roll out said nutrition front-of-pack labeling (FoPL) on its products in five European countries, starting in the first half of 2020.

Commenting on this Dutch move, Judy Schnitger-Zwinkels, Head of Corporate Communications, at Nestlé Netherlands, tells NutritionInsight, “We welcome the

decision of the Dutch government to support Nutri-Score and will engage with the Dutch authorities to ensure compliance with local regulation. It is possible that a few of Nestlé’s multi-lingual products reach the Netherlands before mid-2021. As for the other countries, we will roll-out Nutri-Score across brands of our wholly-owned businesses in the Netherlands once the local framework will have been clarified.” As more European countries choose to adopt Nutri-Score, the French government is planning to make it a system that is internationally administered. It aims to grant it its own, independent scientific committee, according to the Dutch government.

Implementation hurdles Schnitger-Zwinkels affirms that several recent consumer studies show that Nutri-Score is easy-to-understand and helpful for consumers in Europe. Moreover, it has the potential to shift consumer preferences towards healthier diets. Despite how promising Nutri-Score may seem, the RIVM notes that scientific literature fails to provide “convincing and consistent evidence” of the Nutri-Score system’s influence in practice. Moreover, the system does not always comply with the Dutch dietary guidelines in certain areas, the Dutch government asserts.



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Recently, a study published in the journal *Nutrients* affirmed Nutri-Score's high-ranking effectiveness; however, it also concluded that there were no significant differences observed for how FoPLs influenced food choices. More significantly, the Nutri-Score system has been criticized for reflecting "false facts," and thereby misleading consumers, according to a report from the German Sugar Industry Association (WIZ). "I want to facilitate healthy choices for people so they can stay healthy and live longer," says Blokhuis. Source: Rijksoverheid Nederland. The RIVM, the Dutch Nutrition Center and nutritional experts have taken note of these concerns. They flag that there are certain differences between Nutri-Score and Dutch nutritional guidelines. For example, Nutri-Score reportedly ranks white bread too positively, and olive oil too negatively, in comparison with Dutch nutritional advice.

To ensure a factually correct adoption, the Dutch government has plans to actively collaborate with an independent, international scientific committee on how to prepare for the logo's implementation. Blokhuis expects to complete this procedure by mid-2021, so that Dutch producers can legally apply Nutri-Score in the Netherlands. "There is still work to be done before we are satisfied and can continue to fully implement the introduction. We are now opting for Nutri-Score to be able to work with Dutch food scientists and to have it further improved," Blokhuis maintains.

Fighting obesity

One of the most crucial public health problems currently faced by the Dutch government is being overweight, with one in two Dutch people currently overweight. Reducing obesity is, therefore, one of the central topics in the National Prevention Agreement, in which 70 organizations have made agreements toward making the Netherlands a healthier country. In addition to the food choice logo, the Dutch government is also striving to introduce a new approach to using less salt, saturated fat and sugar in products. To motivate people to opt more often for healthier products, producers have agreed that by 2025 there will be 30 percent less sugar in the total amount of soft drinks consumed throughout the Netherlands, according to the Dutch government. Translated and written by AnniSchleicher

Consumers seeks out ways to reduce their sugar intake

Sugar reduction remains a central topic in the media and among consumers and opportunities for reducing sugar intake are taking several directions as companies address evolving concerns and demands.

IFT WEEKLY NEWS November 13, 2019

Sugar reduction remains a central topic in the media and among consumers and opportunities for reducing sugar intake are taking several directions as companies address evolving concerns and demands.

In an Innova Market Insights survey, sugar reduction is a popular option for the three in five U.S. consumers who would rather cut back on sugar than consume artificial sweeteners. Sugar-related claims continue to grow and

increasingly take on more prominent on-pack positionings. In the United States, for example, 8% of all new food and beverage launches tracked by Innova Market Insights in 2018 featured a sugar reduction claim. Claims of no added sugar were most prominent, accounting for 42% of all sugar-related claims, ahead of sugar-free (36%) and low sugar (27%). Although the low sugar claim is smallest in terms of its share of launches, it is also the fastest growing with a growth rate of 17% over 2014–2018. Sugar reduction can be achieved in a number of ways, including removing or reducing the amount of added sugar, replacing part of the sugar formulation with non-nutritive sweeteners, and/or using innovative processing technologies, such as "aeration" to increase perceived sweetness, slow straining milk to remove sugar prior to yogurt making, or using enzymes to convert simple sugars to fibers in juices.

Interest in sugar substitution has also driven the rising use of sweeteners, particularly non-nutritive ones derived from nature, such as stevia, monk fruit, and thaumatin. Allulose, which also occurs naturally in small quantities in a variety of sweet foods such as figs, can also be manufactured synthetically. The April 2019 announcement by the U.S. Food and Drug Administration (FDA) that allulose did not have to be included in total and added sugar counts in U.S. nutritional labeling has also cleared the way for much higher levels of use and a potential move mainstream. Levels of patent activity indicate current interest in the use of allulose, rising 42% in 2018 over 2017, while global new product development in food and beverages featuring the ingredient

had an average annual growth of 45% over 2014–2018, although from a low base.



Another approach to sugar reduction is to use alternative flavor notes, such as bitter, sour, or spicy, exploiting interest in novel and unconventional flavors to reduce the demand for sweetness overall. Interest in botanicals and their health benefits is also rising and may likewise encourage consumers to move away from more sugar laden foods.

Adulterated tea: India threatens legal action as tea consumption in the country remains low

By Pearly Neo
23-Oct-2019
-Food
Navigator Asia

Tea Board India has warned manufacturers and sellers of tea and related

products that adulterating teas with any form of artificial colouring will see legal action being enforced, stating that there is 'no provision' of any sort for using colour in tea.

The board is India's national authority on tea, formed as a government statutory body under the country's Ministry of Commerce and Industry. According to an official notice by the board, tea is not listed as one of the food and beverage items for which added synthetic colouring is allowed, and this is also 'strictly prohibited' for food safety and health reasons. "The treatment of teas with various colouring matters comes under the head of adulterants," said Tea Board India. "The Food Safety and Standards Authority of India (FSSAI) permits the use of eight synthetic [colours] which are nontoxic [that] are allowed to be used in [specific] food items like

sweets, fruit juice etc. Tea is not included in this list of food and beverage items."

According to item 2.10.1 in the FSSAI Food Safety and Standards (Food Products Standards and Food Additives) Regulations 2011 on tea, all related products must be free from 'extraneous matter, added colouring matter and harmful substances'. This restriction on colouring usage applies to all teas, including black, oolong, Kangra camellia and green teas. For tea,



Image © iStock.com/pawandeep singh

colouring is generally added in order to change the colour of or add 'glossiness' to the product, so as to improve both appearance and price. Emphasisi

ng that the use of colouring for tea was wholly unnecessary in terms of non-commercial purposes, the board also threatened legal action on companies that did not comply with FSSAI regulations on this moving forth.

"Colouring matters which are added to tea do not add any value to the product. There is no such provision for use of colour in tea and Tea Board strongly advises adherence to the guidelines of FSSAI, [and this means] not using any colour in tea," it added. "Although it is very difficult to identify colour adulteration in tea, we have simple screening tests that can help us to detect this. If we detect any violation of the above guidelines, this adulteration may attract legal action."

One of the most common tea adulterants is the use of the Plumbago or Black Lead colouring agent for black tea – a major source of contention as this is also used in lead pencils.

Help brought in for tea industry in India

The board acknowledged that no solid evidence exists that proves this agent is hazardous for human health, but stressed that 'adding foreign matter to the teas for the purpose of deception should be strongly discouraged'. India is the world's second-largest tea producer behind China, but local consumption remains low, according to Indian consultancy platform Consultancy.in. "Despite an overall growth in India's consumption levels, its per capita tea consumption did not even make the top25 in the world in 2016, which represents an unfavourable economic situation," it stated. According to Statista, tea consumption in India is estimated at 1.09 billion kilogrammes for 2019, a mere 1.8% increase from 1.07 billion kilogrammes in 2018. This is on the back of reportedly increasingly unstable and decreasing government subsidy provision for the industry, as per Telegraph India.

In an attempt to bring up consumption levels, the Tea Board has brought in Big Four accounting and advisory firm Deloitte to compile a comprehensive report on the industry and possible solutions to this issue. Speaking to Times of India at the Indian Tea GeNext Seminar earlier this year, Tea Board Deputy Chairman Arun Kumar Ray confirmed this, and pushed for the tea industry to be more proactive in helping itself. "Deloitte was hired last month to increase per capita consumption and give emphasis on 'exportable' orthodox tea production," he said. "Instead of pushing the Board for more aid, the industry must come up with comprehensive funding plans. Proper branding and promotion can give Indian tea producers an edge in the overseas market. However, only low-cost tea production can keep the profit margin intact. India spends INR500mn (US\$6.99mn) a year on tea promotion, while the figure is INR3.5bn (US\$48.93mn) for Sri Lanka."



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Aussie sports nutrition regulations: Industry urges regulator to assess impact and stem illegal imports

By TingminKoe 19-Nov-2019 -Food Navigator Asia

Australia's trade body Complementary Medicines Australia (CMA) has urged national regulator Therapeutic Goods Administration (TGA) to conduct a proper impact assessment amid the latter's proposal to classify certain sports nutrition as therapeutic goods.

The TGA recently released a public consultation, proposing to classify non-food appropriate sports nutrition as therapeutic goods, potentially making them subject to same regulations as complementary medicines (supplements). The move is to strengthen regulations on sports nutrition products as the country confronts a number of high-profile deaths arising from the consumption of non-compliant products.

Speaking to NutraIngredients-Asia, Carl Gibson, CEO at CMA, urged the regulator to assess the impact that the proposal would have on the \$1bn complementary medicines industry. "We absolutely understand the need for beefing up the regulatory actions against illegal products, but we are not sure if this is the best way of all. What the industry wants to see now is action taken on illegal products and a proper impact assessment to inform the consultation," he said.

Categorising sports nutrition as therapeutic goods means that

factories will need to meet GMP standards, which adds financial burden onto the manufacturers. "The industry is concerned that there is no capacity for GMP certification... We are talking about six to nine months to go through the upgrading process and there will be a loss of manufacturing capacity during this period of time." He estimated that about 40% of the industry would be affected as a result.

Black market?

Gibson's fear is that if the TGA was to approve the proposal, there will be fewer manufacturers who will make the cut. This may then open up a black market to meet consumers' demand for products that they have been using regularly. "There will be unintended consequences I think, which is a real worry. If you can't register a product in Australia, the unintended consequence is that it will open up a black market, which will drive illegal activities."

He said that the CMA was willing to work with the government on perceived or identified compliance or safety issues. It also urged for a collaborative approach, in which the affected industry, CMA, retail associations, Food Standards Australia New Zealand (FSANZ), and Austrade are involved. The public consultation will end on Dec 3 and the CMA has asked for that to be extended.

"This time, the TGA have actually put forth the public consultation with some draft orders, so it gives the impression that they are going to act very quickly. "Due to the impact across the whole of the sector, we are asking the government to take a step and understand the impact assessment across the whole of the sector."

Australia and NZ regulator reduces minimum protein requirement in milk-based follow-on formula

By Guan Yu Lim
07-Nov-2019
-NutraIngredients Asia

Food Standards Australia New Zealand (FSANZ) has approved an application by Nestle



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Australia and Nestle New Zealand to reduce the minimum protein requirement for milk-based follow-on formula.

This will reduce the protein content from 0.45 g/100 kJ to 0.38 g/100 KJ for only milk-based follow-on formulas in the two countries. Currently, all follow-on formula products must have a protein content between 0.45 g/100 kJ and 1.3 g/100 kJ, based on the availability of L-amino acids. NutraIngredients-Asia understands that Nestle had applied to reduce minimum protein requirement in all follow-on formula products; however, FSANZ had reported that other follow-on formulas such as soy-based were to retain the existing requirement of 0.45 g/100 kJ of protein, due to a lack of evidence. Milk and soy are the most common sources of protein in follow-on formula in Australia and New Zealand.

Codex requirement

Follow-on formula is designed for older infants from 6 months to less than 12 months of age. According to Codex, follow-up formula was defined as "a food intended for use as a liquid part of the weaning diet for the infant from the 6 month on and for young children." The Codex Standard specified protein content between 0.7 g/100 kJ and no more than 1.3 g/100 kJ.

Nutritional safety

In the report, FSANZ had conducted a nutritional safety assessment report concluding that the lower minimum protein level of 0.38 g/100 kJ proposed was appropriate and safe. In its assessment, it considered two randomised control trials, one examining growth trajectories and the other examining weight gain of infants fed lower protein formula (0.39 or 0.40 g/100 kJ) compared to those fed higher protein formula (0.51 or 0.65 g/100 kJ).

Infants ranged from three to 12 months in these studies, and only milk-based formula, were tested. No adverse effects were recorded on growth or weight gain in infants who consumed lower protein formulas. However, there was no evidence to assess other protein sources such as soy. FSANZ said soy protein had different digestibility and amino acid availability than dairy protein sources and hence soy-based follow-on formula must retain the current higher minimum protein amount of 0.45 g/100 kJ to ensure infants are obtaining adequate protein and amino acids.

FSANZ said this will align with the European regulation and Codex standard where soy-based follow-on formula also have higher minimum protein requirements, citing no adverse effect on international trade. FSANZ also said that reducing the minimum protein in milk-based follow-on formula would not pose a risk to the nutrition of older infants.

Industry and consumer impact

The new code is expected to benefit Australian and New Zealand trade, and support business competitiveness and innovation, said FSANZ. It also suggested that producers and importers would have a wider range of protein levels across different products, offering flexibility and efficiency gains for businesses, particularly for those already producing lower protein

follow-on formula in the European Union. Consumers can also expect to have a greater choice of protein content in follow-on formula.

FSANZ, together with many other organisations, has encouraged that breastfeeding is the recommended way to feed infants, and that a safe and nutritious substitute is necessary when breastfeeding is not possible. The amendments will take effect once published on FSANZ website.

Court Order backs phage use against listeria

By Rod Addy 23-Oct-2019 -Food Manufacture

Food firms can keep using phages to fight listeria on ready-to-eat foods in the absence of a developed EU legal framework, according to a European Court of Justice Court Order.

Phages that specifically kill listeria can be used during food processing to prevent the spread of these deadly bacteria on food. Over the past few months, listeria outbreaks have claimed hundreds of deaths, miscarriages and hospitalisations in the UK, Spain, Germany, Austria, Switzerland and the Netherlands and have provoked public concern.

Phages have become an important food safety tool for the industry on all continents. In the US in 2006, the anti-listeria phage product Listex, produced by the Wageningen-based life sciences company Microcos Food Safety, was the first phage product generally recognised as safe (GRAS) and approved as a food processing aid by the Food and Drug Administration (FDA).

However, while this European innovation had been accepted across the world, in Europe itself the availability of the product had been hampered by regulatory uncertainty,

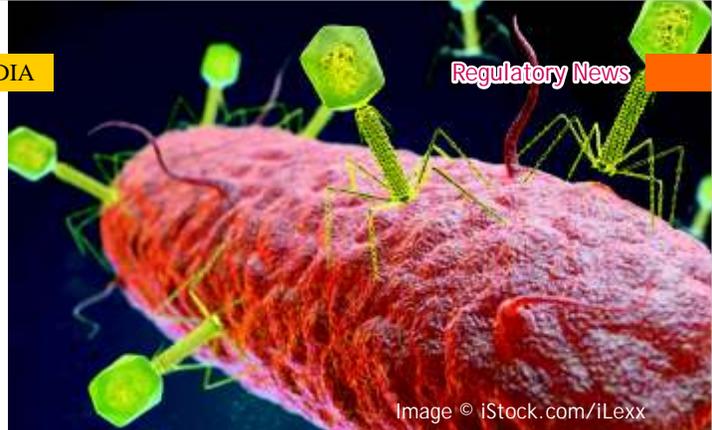


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Microcos Food Safety said. That was despite the fact that the efficacy and safety of the solution had been confirmed by the European Food Safety Authority (EFSA) and was supported by numerous global studies.

The Order of the European Court of Justice had addressed this ambiguity and Listex could be used to prevent the presence of listeria during the final stages of production from growing out to contaminated levels, according to Microcos Food Safety.

EU Phage regulation

Members of the European Parliament are now turning to the European Commission with the urgent advice to develop a specific EU phage regulation, but in the meantime, sufficient clarity had been established by the Court of Justice to apply this technology for the benefit of the European consumer, just as it had across all other continents, Microcos Food Safety said.

Listeria is particularly dangerous for pregnant women, the elderly and immune-compromised. Ready-to-eat products are especially at risk of listeria contamination, as they are usually not heated before consumption. While food processors are responsible for proper hygiene, they lack the tools to deal with naturally present listeria and have urgently called for innovation and additional tools to keep food safe. At the same time, consumers are calling for minimisation of chemical preservatives on food, amid fears these could affect the human microbiome, which is an important part of our immune system.

Phages represent an entirely new category in food safety, without these drawbacks. But ironically, the fact that the use of phages differs from existing methods has been the very cause of the delay to their acceptance in the EU. According to Martin Loessner, professor of food microbiology at the Institute of Food, Nutrition and Health at science, technology, engineering and mathematics university ETH Zürich: "As demonstrated and confirmed by independent scientific investigations over the past 15 years, phages are safe, natural and offer a simple, yet elegant way to prevent listeria on our food products."

High-protein diets risk 'irreversible kidney failure', study warns

By Oliver Morrison 19-Nov-2019 - Food Navigator



Avoiding carbohydrates and substituting them with proteins has become a leading dogma for all those who care for their looks and health, while high-protein diets are very often recommended to people who suffer from diabetes or who are obese. But while cutting carbs may save us calories, high-protein diets risk the health of our kidneys, according to new studies, with people who suffer from diabetes or who are obese particularly vulnerable.

People who are unaware they have mild chronic kidney disease and

who are following a high-protein diet risk 'taking the fast lane to irreversible kidney failure'. Three new studies published in the journal *Nephrology Dialysis Transplantation*, link high-protein diets with kidney damage. Many previous studies have shown that a high-protein diet may harm kidney function. Indeed, many people with a known early-stage chronic kidney disease are recommended a low-protein diet by medical professionals.

But researchers from the European Renal Association-European Dialysis and Transplant Association point out that many people who are unaware they have a mild chronic kidney disease could be following the trend of eating a protein-rich diet because they believe it is healthy. "These people do not know that they are taking the fast lane to irreversible kidney failure," said the ERA-EDTA's Professor Denis Fouque. "It is essential that people know there is another side to high-protein diets, and that incipient kidney disease should always be excluded before one changes one's eating habits and adopts a high-protein diet."

To recommend a high-protein diet to an overweight diabetes patient may cause loss of weight, but also a severe loss of kidney function

Meanwhile, the promise of saving calories and losing weight is why high-protein diets are very often recommended to people who suffer from diabetes or who are obese. But 30% of patients with diabetes suffer from an underlying chronic kidney disease, claimed the scientists, while the number of people affected by type-2 diabetes is rising. The crux of the matter is that these groups of people are especially vulnerable to the kidney-harming effects of a high protein intake, the researchers noted.

"A high-protein diet induces

glomerular hyper-filtration, which, according to our current state of knowledge, may boost a pre-existing low-grade chronic kidney disease, which, by the way, is often prevalent in people with diabetes. It might even increase the risk of de novo kidney diseases", explained Fouque. "To put it in a nutshell: To recommend a high-protein diet to an overweight diabetes patient may indeed result in loss of weight, but also in a severe loss of kidney function. We want one, but we also get the other."

The experts added it is high time that the diabetes population and the general public are warned. "By advising people - especially those with a high risk for chronic kidney disease, namely patients with diabetes, obese people, people with a solitary kidney and probably even elderly people - to eat a protein-rich diet, we are ringing the deathbell for their kidney health and bringing them a big step closer to needing renal replacement therapy," said Fouque.

'The higher the intake, the faster the decline'

The studies published in *Nephrology Dialysis Transplantation* included an analysis of 4,837 Dutch patients aged 60–80 years with a history of heart attack. This showed a strictly linear association between daily protein intake and decline in kidney function. "The higher the intake, the faster the decline," it concluded. The result of an epidemiological study conducted in South Korea pointed to the same direction: persons with the highest protein intake had a 1.3 higher risk of faster GFR (or glomerular filtration rate, a test to measure your level of kidney function and determine your stage of kidney disease loss). The analysis added it was unclear whether it makes any difference if the proteins are animal or plant-based. "The recommendation is to abstain in general from a high protein intake," it said.

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