PFNDAI

FOOD, NUTRITION & SAFETY MAGAZINE

BULLETIN DEC 2021

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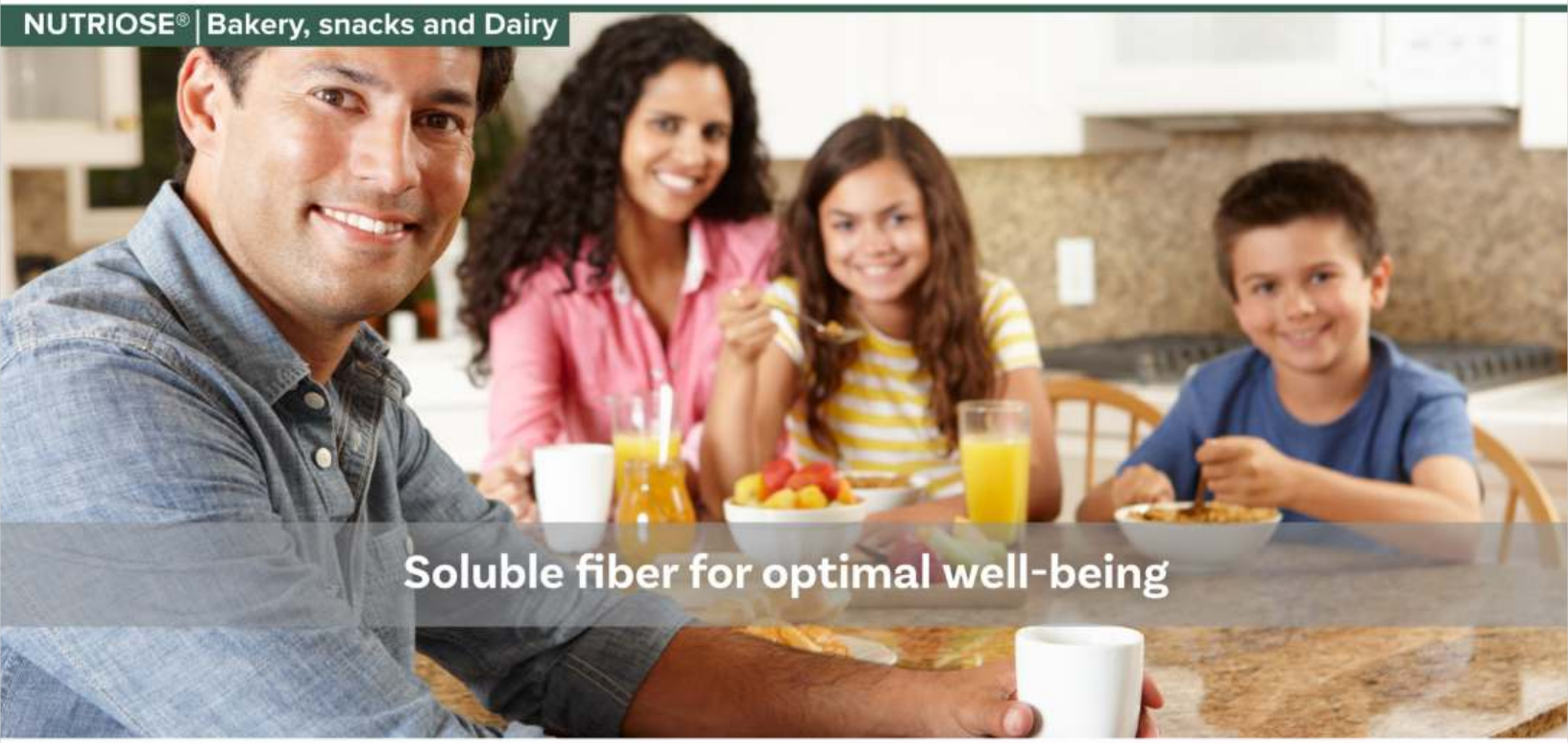


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EDITORIAL

Processed foods have got a lot of criticism lately with many researchers pouncing upon them and joining the bandwagon trying to show that processed foods are the cause of all the ills of today's lifestyle. Common consumers do not have the ability of distinguishing the unprocessed, minimally processed, processed and ultra-processed foods. They just assumed that all the foods bought in packages are processed foods and therefore they must be avoided or at least consumed in restricted amounts.

Consumption of excessive amounts of foods containing too much of fat, sugar and salt will not be healthy even when they are prepared at home. Also just because foods are prepared at home by roasting or heating till they char for flavour, they are not necessarily safe. Just because additives are added in factories instead of home they do not become more harmful.

Also additives have been painted by one brush of being unsafe and people believe that any additive may be harmful. We need to realise that there are additives which are vitamins such as vitamin C and E which are used as antioxidants. There are colours that include riboflavin (vitamin B2) and carotene (precursor of vitamin A) and lutein. Acidulants such as citric acid, acetic acid and lactic acid are used which are present in large quantities in fruits, vinegar and curds. There are thickeners used such as various gums including guar gum, and pectin which are in fact the dietary fibres. Further the law permits only additives that are safe to be used.

Not all the additives are taken from nature but then the definition of ultra-processed foods do not make any distinction and people think that any substance that is added by food company is harmful whereas if the same is added at home it is safe. Rather than trying to turn people against food products prepared by food industry, we should educate them about harmful effects of excess of some components and use the nutrition information as well as the ingredients list to make a better choice to buy safer and nutritious foods.

People should also know that the ingredients that we use at home to prepare home cooked foods are not all unprocessed. Milled rice (whether white, brown or parboiled), wheat flour (both atta and maida), poha, dals, sugar and salt and many such ingredients are prepared by industry by processing. People especially in urban areas have to depend on many food products and ingredients prepared by industry. Such things as pasteurised milk, frozen vegetables and meats etc. maybe not only safe but may be quite nutritious. So rather than creating some slanted view about industry which is also a very important part of the food chain in present day, we should try to show how to select well and choose properly to have a balanced diet.

Many new products that are developed more recently are healthier and more nutritious. Industry has been involving nutritionists in the development and thus incorporating both nutrition and technology would certainly go a long way in making healthier food products.

Prof Jagadish Pai,
Executive Director, PFNDAI

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ASEPTIC PET:

THE 'WONDER-TECH' FOR JUICES & MILK SHAKES

AUTHOR
Mr Rajesh Ponnuru,
Category Manager - Juices & Dairy
Foods Business Division, ITC Limited

Do you think there is a solution for Juices and Milk Shakes that ticks all these boxes?

- ☑ Keeps the beverage fresh for months without refrigeration
- ☑ Preserves the natural taste and nutrition of the beverage without cooked notes
- ☑ Enables you to 'drink and eat', all in one gulp!
- ☑ Let's you choose the pack shape and size
- ☑ Uses easily recyclable packaging
- ☑ Uses 'No Preservatives' whatsoever

What If I say that there is such a Wonder technology?

Beverage Technology - The Need to Innovate

With growing need for "better or you" beverages, the premium & healthy beverage space is evolving fast in the country. Consumers want their beverages to be not just be tasty but also nutritious. There is growing awareness on preservatives and consumers are seeking packaged food solutions sans preservatives. Brands are constantly looking out for ways to stand-out in the crowd, enabled by innovation in product and packaging design. Consumers like the added excitement and goodness that comes by adding fruit pieces, seeds etc. to their beverages.

PET bottles are not new to the beverage industry. But the legacy technologies (cold fill, warm fill, hot fill etc.) were limiting in aspects such as (a) need for use of preservatives when cold filled or warm filled, (b) inability to retain sensory quality of products with high juice content or dairy based products or with fruit pieces/bits (c) limitations on bottle design due to filling temperatures.

The quest for a break-through solution in beverage technology has been there for long. Legacy technologies had their limitations on product and/or packaging design. While Aseptic Carton technologies enabled processing of sensitive flavours and products, these technologies were inflexible with packaging shape and design on a given line and/or in providing consumer with added goodness of fruit pieces, seeds etc. as inclusions in the beverage.

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Creative Visualisation

Aseptic PET overcame many of the limitations of traditional PET filling technologies which has been enabled by two key aspects (1) being able to fill the product at Ambient temperature in aseptic conditions. (2) Blowing and sterilisation of bottle on the line enabling design flexibility of the bottle.

Aseptic PET in industry

Aseptic PET technology has evolved at a rapid pace over the last 2 decades. Advances in bottle sterilisation technologies aided by sophisticated automation and control systems ensured that the technology has not only become highly reliable but also efficient in terms of energy and water consumption.

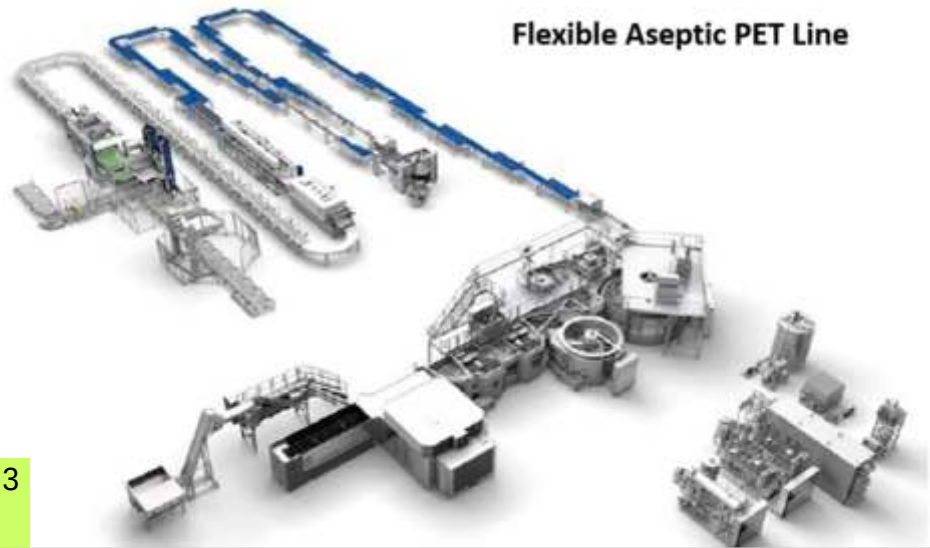
The benefit of this technology was leveraged two years ago. We decided to invest in this technology to offer a whole new range of milk and fruit-based beverages.

A complete line that features the first dry preform sterilization (no water usage was set up in Punjab. The facility offers various pack sizes and multiple product categories with milk and milk-based beverages, fusion of milk and fruit pulp, possibility of adding various types of real fruit bits and many healthy superfoods like chia, flaxseed etc.

All this has been developed in a single line where everything is recycled/reused/redeployed – even resources like steam and water or packaging material to make delightful, safe and preservative free products. Industry has strived to offer products that fulfil a growing consumer need.

Implementation of Aseptic technology in PET packaging beverages industry has been a win-win from all fronts. It is of paramount importance when it comes to a perishable commodity like milk or milk products. It is helping business to utilize available milk to create better product proposition. The technology enables long-term availability and reduces wastages.

The technology has enabled business to support and reach far end consumers to ensure availability at an affordable price. The technology has offered many innovative ways to delight consumers. It has enabled milk go through the transformational journey from just plain milk to the whole new world of milkshakes, flavoured milk, fusion of milk and fruit pulp, milk with real fruit chunks etc. These innovations have a remarkable shelf stable packaging which doesn't require cold chain, hence are low on carbon foot print.



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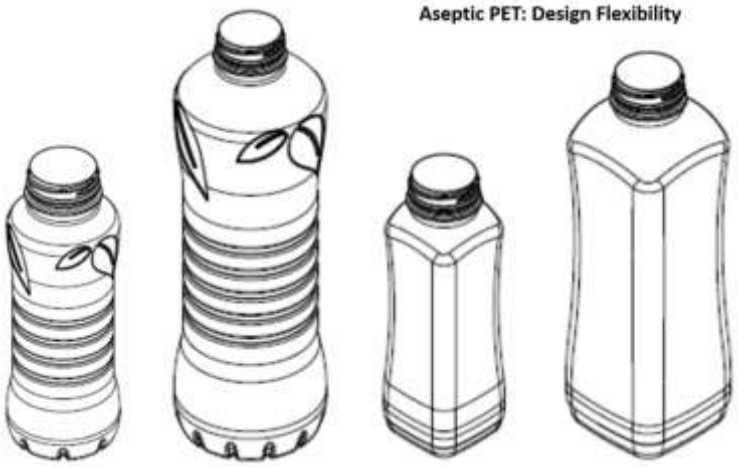

The packaging is transparent and offers a great view of the product, combined with clean labels. This gives confidence to the consumer regarding the product. It also speaks of the robust technology that is deployed to manufacture the product. During the sterilization process, the product is heated for a few seconds, instead of relatively long heating cycle in traditional processes. This maintains the highest quality including retention of natural flavour, colour and other nutritional values.

The packaging itself has the lowest footprint in terms of supply chain as well as the consumption of resources, and iscompletely environmentally friendly. Technology enables usage of up to 40% less PET material and still delivers aseptic packaging properties over conventional technology. The PET used is completely recyclable. From the sustainability point of few, recent innovations in technology have led to zero usage of water for achieving sterility of packaging material, possibility of adding chunks with preservatives and flexibility of creating a wide range of products (from flavoured milk, acidified milk products, milkshakes, fruit juices) on a single line with minimal changeover time. All this is leading to enhanced uptime for production and reduced changeover time, which is cost effective and low on consumption of resources.

Aseptic technology offers flexibility with a range of product categories on the same line i.e. fruit Juices, vegetable juices, fruit and vegetable mixes, soups, milk and milk-based beverages, fusion of milk and fruit pulp, possibility of adding various types of real fruit bits and healthy superfoodslike chia, flaxseed etc.

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MOLECULAR GASTRONOMY: FUTURISTIC APPROACH ON FOOD

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Imagine sitting in a restaurant, waiting for your order of tomato soup, but then how would you feel upon receiving a sphere instead, which has the exact colour and flavour of tomato soup. You will be a little confused but excited at the same time to try and find out what it is.

Well with this kind of a thing in front of you, you definitely would start thinking and guessing the science behind a tomato soup sphere. This is the result of Spherification (Almeida & others 2014). In this technique, calcium chloride and sodium alginate are mixed together to form a gel. And this is 'Molecular Gastronomy' for you (Burke & others 2019; Burke & others 2016).

A branch of food science, Molecular Gastronomy examines the physical and chemical reactions that occur in cooking. These processes and interactions are explored and utilized to yield flavourful, functional, and artistic results. Most commonly, molecular gastronomy techniques are used by restaurants and home experimenters. 'Molecular' i.e. molecule, here used as shape and 'Gastronomy' in terms of the practice or art of choosing, cooking and eating good food. These terms together give the art of giving shape by choosing and cooking but giving a chemical and physical transformation to food is quite a challenging job (Mills 2020; WebrestaurantStore).

Herve This, a French INRA (Institut national de la recherche Agronomique) chemist and Nicholas Kurti, who was an Oxford physicist coined the term 'Molecular Gastronomy' in 1988. Molecular Gastronomy is an implementation of food science that makes the physical and chemical transformations of ingredients which are required to complete the recipe. It is one of the most recent researches done in the past 30 years of the emerging industry of food science. Molecular gastronomy is a relatively new term; one that has caused much confusion and controversy. However, Molecular Gastronomy can be confused with 'molecular cuisine' and 'molecular cooking' that are only culinary trends on using Molecular Gastronomy (Caporaso & Formisano 2016).The kitchen and science are united in Molecular Gastronomy.

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It will not deal with the biological function of food, but the background of the production of a dish or food. This will involve taking a look at chemistry and physics (This 2006).

Herve This further redefined the definition of Molecular Gastronomy. In which he distinguishes between Molecular Gastronomy, the study of processes

during cooking and molecular cuisine, the application of these recipes and food preparations. The first is science and the second is technology. Molecular Gastronomy is therefore situated between science and application. These molecular dishes are innovated by applying molecular gastronomy, thus providing us with a fresh outlook on eating and the art of cooking and choosing techniques of cooking (This 2014).

How Does Molecular Gastronomy Work?

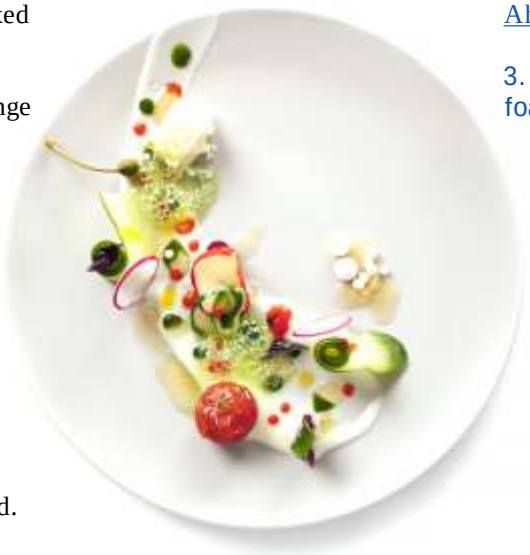
Molecular gastronomy works because of the interactions of different ingredients that cause various effects. Every recipe has underlying physical, biological, and chemical mechanisms that make the dish turn out as intended (Harris 2009).

For example, A souffle "inflates" instead of becoming like a pancake as a result of the proteins that make up egg whites. When the egg whites are whipped, tiny air bubbles are created, which expand when heated. The combination of the heating and setting of the egg proteins and air bubbles causes inflation. Soufflé is a common recipe, but molecular gastronomy also seeks to identify new and innovative mechanisms and outcomes.

Here are a few techniques that are used in Molecular Gastronomy:

1. Spherification:

Spherification is arguably the commonly seen molecular gastronomy technique. A thin membrane traps liquid ingredients like pearls or caviar eggs with a tasteless membrane that forms clear beads that are basically like caviar eggs or pearls (Lee & Rogers 2012). The technique is based on a reaction between calcium chloride and sodium alginate, two substances that when mixed together gel together. For example, Orange juice is mixed with calcium chloride and then dropped into a mixture of alginate and water, 1 drop at a time, each drop immediately forming a bead. The specification is very simple and any liquid can be transformed into a delicious edible bead to accompany dishes and drinks.



2. Sous vide:

Sous vide is a French term that means ‘under vacuum’. Sous Vide is the technique of slow cooking egg, vegetable, fish and especially meat under a water bath at lower temperatures (50-80°C) for an extended period of time, such molecular gastronomy techniques have existed since the late 1700s. A constant temperature cooks meat evenly, no juices escape and it is never overdone and because the temperature is so low, the food cells do not rupture rendering the texture superbly succulent and tender. The cooking times can vary but sometimes can last for as long as two or three days. Sous Vide requires special treatment and equipment more specifically sous vide machine or some type of immersion circulator (Ayub & Ahmad 2019).

3. Emulsification or foam formation

Foams or airs as they are sometimes called are used in molecular gastronomy to add an extra touch of flavour in almost ethereal quality to a dish. Super light, you almost don't

see them, but rather the foam dissolves in your mouth enveloping your taste buds in a flavour that disappears seemingly into thin air. The technique is not hard to master as it mainly relies on using a hand blender to make the ingredient of choice with soy lecithin. The flavour of an emulsifier derived from soya bean lecithin won't affect the flavour of foam, instead finding the right proportion is what will create a perfect foam. The application is endless from balsamic foam to put over strawberries, to a citrus air to top a Margarita Cocktail to the inventive chive foam recipes.

4. Gelification

One of the most intricate molecular gastronomy techniques, it relies on gelling agents like agar agar or Carrageenan. In this technique, liquids turn into a more solid state. This allows the cook to sir what are typically liquid dishes in a new more solid and unpredictable format. It is amazing that this application allows you to eat food in a totally new way, especially with the "noodles" technique. For this technique, the gelling agent is mixed with the liquid ingredient of your choices like tomato soup or watermelon juice and brought to a boil then later passed through a clear silicone tube to achieve spaghetti shape under an ice bath. The result is a perfectly shaped gel "noodles".

5. Liquid Nitrogen or flash freezing

There is an 1890 recipe book where liquid nitrogen was mentioned as a cooking ingredient titled "Fancy Ices by Mrs. Agnes Marshall". It is one of the oldest techniques, but it is very popular nowadays. It is employed in more recent times by restaurants in the preparation of frozen desserts such as ice cream which can be created within moments at the table because of the speed at which it cools food. The quickness of chilling also leads to the formation of smaller ice crystals, which provides the dessert with a smoother texture. The technique is employed by Chef Heston Blumenthal who has used it at his restaurant to create frozen dishes such as egg and bacon ice cream. Additionally, liquid nitrogen has become popular for use in the preparation of cocktails because it can quickly chill glasses or freeze ingredients (Konovalova & Tvorogova 2017).

Molecular Gastronomy vs Food Science (Yek & Struwe 2008)

Food science is the larger discipline that encompasses molecular gastronomy. Like molecular gastronomy, food science also concerns the physical, biological, and chemical composition of ingredients. However, it deals with how the composition pertains to production, nutrition, deterioration, and food safety on the industrial and mass food production level. On the other hand, the intent of molecular gastronomy is for culinary understanding and experimentation of dishes in restaurants and homes.

As a result of molecular gastronomy, chefs, scientists, and home chefs can experiment with food techniques and, in many cases, share experiences of culinary innovation and delight. It does not destroy the food but it is a chemical and physical transformation of food, even the nutritional values are neither destroyed nor enhanced during the process. When consumed in moderation, molecular gastronomy is generally considered safe. However, the dishes only contain a small amount of chemicals, and people consume them only occasionally. Thus, there are limited exposures to potentially unsafe ingredients and unlikely long-term effects (Vega & Ubbink 2008).

The field of molecular gastronomy provides a platform for chefs and home cooks alike to experiment and share unique dishes (This 2019).

FOOD FORTIFICATION – SAVING INDIA FROM THE WRATH OF HIDDEN HUNGER

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Nutrition is what nurtures our body from the inside out. What we consume is reflected in our physical and mental being. Unfortunately, as a developing country, India has been facing a broad spectrum of challenges; Malnutrition and Hidden hunger are a few crucial ones among them.

"80% of teenagers in India are suffering from malnutrition and hidden hunger." – Adolescents, Diets and Nutrition, a report by UNICEF (2019)

Micronutrient deficiency has become one of the leading causes of severe diseases in adolescents today. Not just children, but people aged above 50 are also malnourished in our country. Every year we are stunned by dreadful statistics on malnutrition and hidden hunger.

But, What Is Hidden Hunger?

It is a form of malnourishment that majorly results from the deficiency of vitamins and minerals, including zinc, iron, iodine and folic acid in the diet. Every human being requires a certain amount of essential micronutrients to support bodily functions. When such nutrients do not reach the body in an appropriate proportion, a situation of malnutrition arises.

While there are plenty of effective solutions that can control the situation of hidden hunger in our country, the element of poverty and unavailability of adequate nourishment to the poor class still haunts the efforts.

Let's take a look at the Global Hunger Index of the year 2021:

Despite the combined efforts of government and private institutions to tackle malnutrition in the country, India stands on the verge of an extremely grave situation of hunger. There is no doubt in asserting that malnutrition has most affected the children in our country. The rates are quite alarming where the stunting rate is declining at a snail pace and the wasting rate continues to impact young lives.

And What Do Indian Plates Look Like?

The mean percentage of energy from different food items differs in rural and urban India. For instance, compared to urban areas, rural villages consume more cereals and millets (65.2%), on the other hand, urban India is consuming more pulses and legumes (11.1%) than in rural parts. All these statistics clearly state the unevenness in Indian diets that eventually leads to malnourishment.

So, what can save India from the wrath of hidden hunger? Food fortification, indeed.

https://www.nin.res.in/downloads/My_Plate_English.pdf

Food Fortification – An Affordable Saviour

The food and beverage we consume already consists of nutrients that the body requires, but in order to fill the gap of micronutrients in the body, it is essential to turn towards fortified food. Fortification of food is the process of enriching food and beverages with

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vitamins and minerals to make them nutritiously potent. Food Fortification Resource Centre is an arm of FSSAI that looks after food fortification in India. Government-approved fortified food staples include oil, wheat flour, milk, etc.

What Are The Strategic Advantages of Food Fortification?

Food fortification has been adopted as a potential strategy to curb the issue of micronutrient deficiency in India. It is considered a great opportunity to improve the micronutrient status of populations. Here are a few benefits of bringing food fortification to the mainstream food industry:

#1 Staple Foods Consumed By All

Currently, Food Fortification is only approved for staple foods like Wheat flour, Oil, Milk, etc., which are the basic necessity for all making it easier for people to consume them regularly. People will not have to go beyond their staple foods to get a boost of micronutrients when they start consuming fortified foods.

#2 Simple and Affordable Technology

Compared to other means of nutrition supply including vitamin supplements and expensive diets, fortified foods are uncomplicated and extremely affordable. It is a cost-effective and elementary technology to tackle malnutrition in the country that is seamless in every way.

#3 Preventive And Global Approach

Fortified foods are boosted with vitamins and minerals that will enrich bodies with vitamins, and minerals. Hence, it is a preventive approach to mitigate the hunger index. At the same time, food fortification can be established as a global strategy making fortified food items available to the populations.

#4 No Risk of Excessive Intake

Food items already consist of nutrients, but fortifying them with further nutrients does not make them harmful to the body due to overage. During fortification, only low doses of micronutrients are added which makes it completely safe for regular consumption.

#5 No Change In Characteristics

If you think fortification will change the appearance, taste, quality and efficacy of your favourite food, then you are mistaken. FFRC has stated that fortification does not alter the characteristics of food items, it just enhances its nutritional value that benefits your body in different ways.

#6 Increased Durability

It has been found that fortified staple food with micronutrients has better cooking and shelf life. They don't get stale easily, unlike their unfortified version. So, it is just a brownie point for those who want to consume fortified food regularly.

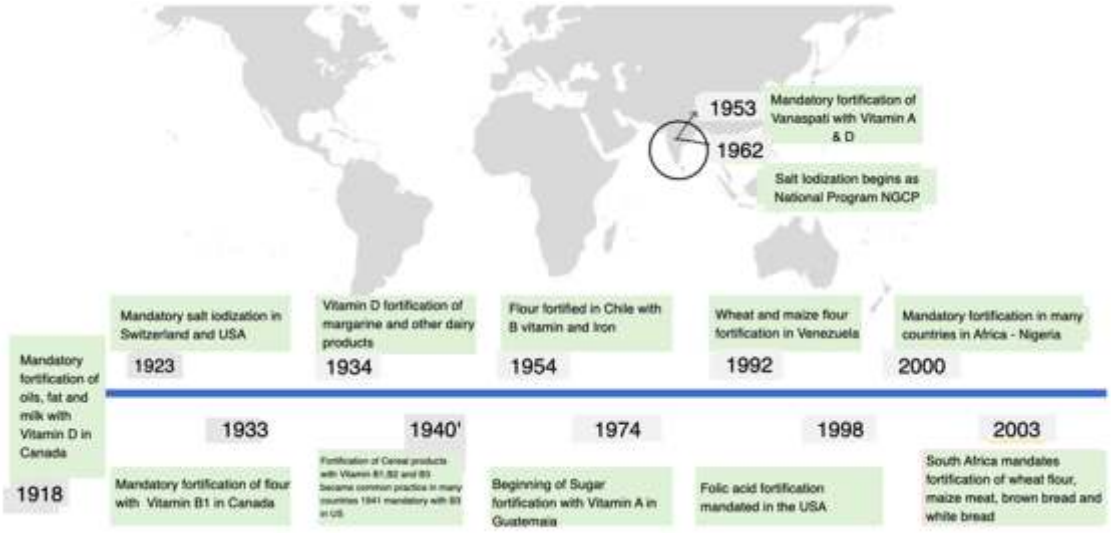
"Salt iodisation in India contributed 1.4% of GDP growth by reducing brain damage cases in children." - Ministry of Women & Child Development.

Food fortification is not a current technology but its origin dates back to 1918 when mandatory fortification of fat, oil and milk with vitamin D first happened in Canada. Later on, salt iodization was adopted in Switzerland and the USA.

It was in 1953 that Indian lands acknowledged fortification and started mandatory fortification of Vanaspati with vitamin A & D.

In 1962, salt iodization was started as a National Program under National Iodine Deficiency Disorders Control Programme (NGCP).

Food Fortification – Down The Memory Lane



It is just the beginning; food fortification is still not adopted as a general practice in the food industry. With combined efforts and persistence, we can eradicate hidden hunger from Indian lands.

Why Fortification Of Food Is The Need Of The Hour?

From the perspective of nutritional health, the COVID-19 pandemic has intensely impacted the global economy. Prior to the pandemic, half a million people worldwide were burdened by nutritional deficiencies and COVID-19 acted as fuel in the fire. The stunting and wasting rate dropped significantly creating an alarming situation for the health and nutrition industry. Above that, unemployment and low income continuously affected the food security and nutrient intake of households posing a high risk of malnutrition and other micronutrient deficiency.

With or without the pandemic, good nutrition is a critical factor responsible for the efficient working of human organs and the immune system that protects the body from ailments.
In the context of COVID-19 WHO's guidance on diet stated that "good nutrition is mandatory in the times of health crisis like a pandemic to further strengthen the immune system and fight the virus."

There are many pieces of evidence that outline the importance of nutrition in reducing the severity of COVID-19 and filling the nutritional gaps is proven to be a viable solution for it. Food fortification has yet again emerged as an effective approach to enhance public health during the pandemic. With the Omicron virus spreading its deadly tentacles over the globe, a nutritious precaution will help global populations to prepare their immune system to fight the worst.

Fortification of Staple Food

Staple foods like rice, wheat, maize, cereals, pulses, etc are consumed by large masses, due to their wide accessibility and affordability. Hence, the fortification of staple foods should be made mandatory to address the nutritional deficiency. It is a safe, affordable, and viable strategy that will provide individuals with a boost of micronutrients that otherwise lack in their diet.

"60% of the Indian population is consuming staple foods daily." – Statistica.com

Fortification of flours, cereals, cooking oils and salts have been made compulsory in many countries. India has had a successful track record of fortification with iodised salt production since the 1950s. Research and studies have proven time and again that adequate consumption of micronutrients like vitamins and iodine help in preventing infections and reducing the risks of birth defects.
Vitamin A fortified flour and edible oil is a great option for pregnant and lactating mothers to improve breast milk quality and enhance infants' health. Not just enhancing general well-being, fortified staple foods have the potential to cater to the ever-growing issue of malnutrition and hidden hunger.

FSSAI and Indian nutraceutical industries are on the pathway to promote rice and wheat flour fortification which is the most consumed staple food in the country. There is no doubt in asserting that staple food fortified with micronutrients is a productive approach to make nutritious food accessible to the lower-income population. Fortified staple foods have the prowess to reduce stunting & wasting, and improve infant health.

The Indian government and public-private partnerships are continuously making efforts for the availability, affordability and consumption of essential micronutrients. There have been continuous efforts to promote large scale fortification of staple foods and make them available to the lower-income population in India thereby, improving the malnutrition scenario in the country. In this pandemic, it is highly essential to increase the production & distribution of fortified food and micronutrient premixes.

It has become more necessary than ever because most of the Indian population relies on staple foods and the upcoming pandemic is a signal to accelerate the process to revitalize both health and economy.

FSSAI Approved Staple Foods:

- Rice
- Wheat Flour
- Edible Oil
- Salt
- Milk

Fortification of Processed Food

With growing technology and lifestyle, the food choices of populations have been taking a sharp turn. Indeed, people are in search of good nutrition, it's just that their food preferences have been changed. Over the past few decades, the popularity of processed food has spiked dynamically. People are preferring processed food over their natively available alternative. There are many reasons behind this shift, food choices, ease of use, and travel-friendly eating, to name a few. From fruit beverages, bakery goods to even vegetables, there is an abundance of food items that come in appealing and spill-proof packaging.

"An average Indian household consumes a larger number of calories from processed food than vegetables & fruits." – BMC Public Health

But are these processed foods good for your health? Do they provide the exact nutrient content as their unprocessed self? Probably not, because processed be it canned, frozen or preserved, go through a series of procedures that may reduce their nutrient capacity.

As a result, it is imperative to fortify processed food with essential micronutrients. Many fruit beverages, bakery goods and packaged food have been fortified with essential vitamins and minerals to maintain their nutrition profile. After setting the base for staple fortification, FSSAI has set the groundwork and guidelines for processed food fortification. The regulatory body has notified the permitted levels of fortifying processed food with micronutrients. Fortification should be providing 15-30% of the daily recommended dietary allowance (RDA).

Companies are open to fortifying their processed food voluntarily with micronutrients, but products with high sugar, salt and fat content will be exempted from the process. According to this FSSAI notification, fortified processed food may contain some amount of staple food as raw material.

The fortification of processed foods is especially beneficial for urban people who live fast-paced lives and have aggressive food choices. In the quest of consuming ready to cook food, they often lag meeting the nutrition intake leading to several nutritional deficiencies. Food companies can fortify processed food with vitamin A, B12, iron, folic acid, and zinc to fill the nutritional gaps in people's lives.

To further stop a generation from falling into the pits of malnutrition, it is necessary to take the matter into hands and make fortification of processed foods mandatory.

FSSAI Approved Processed Foods:

- Breakfast Cereals
- Biscuits
- Bread
- Rusks
- Pasta Noodles
- Buns
- Fruit Juices

FSSAI's Efforts To Make Encourage Food Fortification

FSSAI has approved food fortification as a strategic approach to address some crucial nutritional crises like malnutrition and hidden hunger in the country. For more than a decade, FSSAI has been executing programs and publishing notifications with respect to food fortification, thereby increasing its process on a national scale.

Rice and wheat flour fortification is commencing in full swing throughout the country. During the pandemic last year, FSSAI released a notification to seek opinions of stakeholders on fortification of edible oils and milk with vitamin A & D and by the year-end, we started consuming fortified milk and oil along with other staples.

FSSAI has also notified the fortification standards for five staples: edible oil, rice, flour, salt and milk. The F+ logo was also launched meant to be displayed over the packaging allowing consumers to easily identify fortified foods.

https://eatrightindia.gov.in/ArchiveERI/foodFortification.jsp

Hexagon Nutrition – A Tread Towards Nutritional Tomorrow

At Hexagon Nutrition, every day we push our limits to bring innovation in the world of food fortification with our micronutrient premixes, malnutrition products, and other nutritional supplements. We aim to normalize food fortification and make it available to a wide population. Whether it is spreading awareness about fortified foods or creating custom blends of fortified food & beverages, Hexagon Nutrition will not leave any stones unturned when it comes to addressing the issue of malnutrition in India. Read more about hexagon nutrition here: https://www.hexagonnutrition.com/

MARKETING STRATEGIES IN CHANGING ENVIRONMENT DUE TO E-TAILING & NEW DELIVERY SYSTEMS

AUTHOR
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What is Marketing? – It is the activity, set of institutions and set of processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large. Marketing activities centre on an organization's efforts to satisfy customer wants and needs with products and services that offer competitive value.

As we all know that the year 2020 did not have a good start. Countries all over the world were under lockdown due to the corona virus outbreak and posed several challenges for brands. This corona virus (COVID-19) global pandemic has resulted in changes to advertising, marketing, promotional and media spends, forcing businesses and brands to re-evaluate their thinking about current and future advertising and marketing campaigns to maintain a steady stream of income.

Pandemic has created a benchmark due to which people are turning to the brands on which they trust. The reason behind this is that the current scenario has made people more conscious about safety. They are looking at the brands that promise safe and hygienic products and have been useful to them during pandemic by delivering products at their doorsteps without the need of consumers going out in the unsafe environment. They also looked at the product as well as information that were provided on aspects that were useful in tackling the problems. Several consumers looked at new brands due to innovative or sensitive way they responded to the virus outbreak. For e.g., Consumers got attracted to products that were well packed, had any immunity-based ingredients, etc.

Another interesting thing that is happening in the world of digital media is that we all are bombarded with messages and the screen time has therefore increased. Messaging has become sharper in the current environment because the amount of content which is available has quadrupled and gone to trillions of data bytes.

As Covid-19 pandemic has already boosted digital media and increased its consumption, the online platforms are now used by many young entrepreneurs, start-ups, and many professionals for showcasing their talents. The greatest beneficiaries are going to be the social media network brands as people turn to these platforms to connect with their loved ones or to access relevant information. Brands like Netflix and Amazon Prime are also likely to see rise in both subscriptions and view times as people seek news and entertainment.

The other trend which we are experiencing now is 'Vocal for Local', which means to not only buy local products but be vocal about promoting them. This is getting a lot of momentum where people are looking at it as one way of contributing to the country and the society. We all must have seen when the covid 19 virus outbreak was at the peak, the people who came for our rescue werethe Mom & Pop stores (small, family-owned, or independent business).

The healthcare and wellbeing brands are likely to have better growth prospects in coming years with increased investments in healthcare and sanitation sectors. Companies that are manufacturing nutritious products, nutrition lead products, immunity building, and mental wellbeing products are growing rapidly.

Necessity is the mother of all inventions. We have seen technology getting stronger under challenging times like these. Today's world is of AI. We can see AI is ruling the world.It stores number of data which includes the consumers' likes, behaviour, type of product that should be launched in the market etc. Companies can use such technologies, leverage the brand, and launch product.

Many brands are allowing their employees to work from home. Before the pandemic started, in every product launch we used to see many people use to join the event and the total time taken for any product launch would not be less than 12 to 18 months but now with the help of AI, companies are launching their products without people being physically in the offices and the total time taken here to launch any product is 3 to 9 weeks. We can also see telehealth systems where doctors can diagnose, treat, and operate patients without the need of the patient being physically near them.

Digital is the new world, and people are living a digital life. Because of this digital life, E-commerce is gaining the benefit and is building on its own momentum. As physical shops areclosed in such challenging times and consumers try and avoid crowded stores, E Commerce is bound to grow. Consumers who usually prefer visiting the grocery shop are now practising social

distancing at this moment and switching onto online buying. E commerce is the new marketplace but that does not mean that modern trade and general trade will disappear, it has been important in India and will always be.

In the E commerce space, it becomes important for the brand owners to launch new product, to make sure that the product is visible, to find out whether they are generating personalised information & content in the market, which is going beyond advertising. Because of increasing demand on the channel, it is essential for the brands to know whom they are addressing and on which channel, is their product available, are they using partners' inventory to create and communicate.

In this E commerce world, listing your product is very easy. People can list their product and start selling it at a minimal cost. Enlisting, enrolling, launching new product and flexibility of knowing what you must do is very effective on this platform. There are many companies who have become successful by listing their product on the top channels, addressed the right audience, focused more on content rather than advertising where people see and talk about the productand have gained lot of reviews.

Marketing Strategies in Changing Environment due to E-Tailing & New Delivery Systems

Social media platforms have become the main source of information. And because of this we can see rise in social media adoption.People are dependent on social networking sites like Instagram, Facebook, Twitter etc. to stay up-to-date. This has led to the opportunity to use social media marketing at its best; to connect and bond with customers in meaningful ways. Customers mostly engage with brands that do more than just sell.

Word of mouth is another important factor. It is the process of actively influencing and encouraging organic word of mouth discussion about a brand, organization, resource, or event. One can have micro-influencers who can create a lot of interest. On E-commerce platform, visibility and availability of products is extremely important.

Direct to consumer has accelerated during Covid; it is a term that means when brands sell directly to their end customers without selling through a retailer, distributor, wholesaler, or other outlet. Stores on wheels were launched, where they stepped out and reached to thousands of societies, connected with consumers on WhatsApp and sold their products directly to the consumers. Another thing that is happening in this situation is direct connectivity with the retailer and the distributors online.

Jio and Facebook are building E-commerce system with retail/commerce as core service. This will have a huge and complex structure addressing all kinds of events in marketing. It will be omni channel having both online platform as well as the physical store. It will work with both the channels where at one end it will have the power of WhatsApp and Facebook and at the other end the physical stores. This is basically a non-traditional format.

Similarly, we saw other channels, which came into existence for distribution of different food products, for example, Zomato, Amway and Dominos started selling essential food products online.

Another thing that happened was direct connectivity with retailers and distributors online. With the help of apps, it was easier to get orders from distributors and retailers.

Another trend that we see actively coming up is the frozen foods. In frozen food sector there is a lot of scope for expansion, but we can also see some challenges. One of the challenges is that only one in ten retail outlets stocks frozen versus non-frozen foods and the stores, which are willing to stock those products and sell it, there,'s battle happening in the small freezer among the brands. There are also problems of proper maintenance of freezers with respect to hygiene and proper temperature. But as we all know that every problem has a solution, FMGC companies have the technical and other experts to help in solve such problems. To overcome the problem of the frozen battle we can see there are companies who have started their own cart on wheels just like the ice cream cart, they have started selling their frozen product on wheels that goes around the streets where consumer can come and buy. Another thing that companies can do is put the freezer machines in places like societies where consumers can buy just like in vending machines. It can help the consumer to get the availability of product near them rather than going to the physical store, whereas we all know that the shops that sell frozen product are very limited.

Due to the Covid19 pandemic the E-commerce sector has risen, this is an opportunity for brands to come with different ideas to boost their product, many of our local markets may have affected with the emergence of the current crisis, but social media's growing relevance has diversified marketing avenues. Using demographics to choose ideal platforms, capitalizing on trends, and investing in different kinds of marketing can help people sustain their brand. As the situation is changing, brand should try to turn their problems into possibilities and obstacles into opportunities.

SPICE UP YOUR HEALTH!!

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We grew up eating food that is delicious and nutritious at the same time. Can you imagine your dal without tadka? Your sabji without garam masala? Can you eat your food without flavor? No, right? Then from where does this rich flavor, aroma, taste that we have to our food come from? Yes, You guessed it right! It is because of the spices we use in our cooking. India is a land of exotic spices.

Spices have been an integral part of our Indian cuisine for don't know how many years. The major contributor to the authentic taste of Indian food is the spices. You can not imagine Indian food without spices. There are a variety of spices like cinnamon, cumin, mustard, bay leaf, turmeric, ginger, garlic, star anise, cardamom, and many more. A magical blend of these spices has the power of bringing out the best in any dish. Sprinkle a bland, flavorless dish with a little bit of spice mix and it will immediately elevate the taste profile of that dish. This is the power of spices. But are these spices only limited to providing flavor and aroma? Let's find out.

Spices and their flavor-

Spices are different parts of the plant including roots, seeds, fruit, bark, stem, etc. Often they are used in dried or fresh form. They provide flavor, aroma, and color to the food. Every spice has its unique flavor and aroma with varying intensity. The reason for this distinct flavor of each spice is the different chemical compounds present in each spice. Here are some of the spices along with their flavoring compound.

Spices and health- (Liu Q & others 2017;Sharif MK & others 2018;)

There is more to spices than just providing flavor. Spices have great medicinal value. Spices have been an important part of Ayurveda for centuries. Ayurveda has been using various spices as whole, powder, or extract in treating many health conditions. Knowingly or unknowingly we have been using spices as home remedies for years. We often hear our grandma or mother telling us to put Haldi(turmeric) on a cut wound or eat ajwain for stomach aches.

Table 1- Flavor compounds of spices

Spice	Flavor compounds
Allspice	Eugenol. b-caryophyllene
Anise	(E)-anethole, methyl, chavicol
Bay laurel	1.8-cineole
Black pepper	Piperine, S-3-Carene, b-caryophyllene
Caraway	d-carvone, carone deri vati yes
Cardamom	a-terpinyl acetate. 1-8-cineule. Linalool
Cinnamon, cassia	Cinnamaldehyde,eugenol
Chilli	Capsaicin,dihydro capsaicin
Clove	Eugenol, eugeneyl acetate
Coriander	d-linalool. C10-C 14-2-alkenals
Cumin	Cuminaldehyde. p-l.3-mentha-dienal
Dill	d-carvone
Fennel	(E)-anethole, fenchone
Ginger	Gingerol,Shogaol, neral,geranial
Mace	a-pinene,sabinene, 1-terpenin-4-ol.
Mustard	Ally isothiocyanate
Nutmeg	Sabinine,a-pinene, myristicin
Saffron	Safranol
Turmeric	Turmerone,Zingeberene, 1,8-cineole
Vanilla	Vanillin, p-OH-benzyl-methyl ether

(Source- Spice Board India, 2021).

There are many home remedies that we have been using as a part of initial treatment for many years. It is very natural for us to suggest a home remedy involving spices because we grew up using and learning them from our elders. But that is not the case with the whole world. Many countries did not know the importance of spices up until now. The medicinal effects of spices are gaining popularity these days. Many people want to include spices in their food to avoid or control certain health conditions. There are numerous benefits of using spices.

Recently spices and herbs have been studied for their potential antiviral preventive and immunity boosting effect during Covid-19 pandemic. Some spices and herbs have shown potential for boosting immunity. (Singh NA & others 2021)

Here are some of the spices along with their health benefits.

1. Turmeric (Ettanil J & Zachariah T, 2016)

Turmeric is the most common ingredient that you will find on your kitchen shelf. Almost all the dishes include a pinch of turmeric to add that color and flavor. Turmeric is a plant in the ginger family commonly grown in southeast Asia, India to be exact. The rhizome of the turmeric plant is used for seasoning food. Turmeric has been a superfood for centuries in India and now the world is taking note of it.

Apart from seasoning, turmeric has many health benefits. Turmeric contains many active compounds, curcumin, alpha, and beta tumerone, zingiberene, and curcumol which are responsible for these health benefits. Curcumin can help fight inflammation, keep blood sugar level steady, protects against viral infection, and ease depression symptoms. Some studies show that turmeric can reduce LDL cholesterol. Turmeric is best known for its anti-inflammatory properties. Some studies show that the anti-inflammatory properties of curcumin can help in reducing pain and inflammation in Alzheimer's and Arthritis patients. Turmeric also shows anti-cancer activities. Apart from these benefits, turmeric can help against irritable bowel syndrome, acne, and headache. But, keep in mind that curcumin in turmeric is very low and also it is poorly absorbed in our body so, it will not be the cure-all.

2. Garlic- (Kim ID & others 2019)

Garlic is an important part of many cuisines worldwide. It is known for its strong flavor. Garlic produces a compound called allicin which is responsible for its smell and also multiple health benefits. Odorless garlic/black garlic can also be prepared by aging and fermenting which has its own chemistry and benefits.

Adding garlic to your food can help against conditions related to the heart and blood system. With the proceeding age hardening of the arteries (atherosclerosis) may occur. Consuming garlic may help to slow down the hardening of arteries. Garlic may help in reducing total or LDL cholesterol and also helps in controlling high blood pressure. Taking garlic by mouth can help in improving liver health in conditions likeNonalcoholic fatty liver disease (NAFLD). Having garlic extract twice a day can improve gum health and protect against periodontitis.

3. Black Pepper- (K Sanatombi & R Sanatombi 2020)

This spice has been a part of multiple cuisines for years. Black pepper is called the king of spices. Pepper has many types based upon coloration. The commonly used black pepper is the almost riped peppercorn dried until they turn black. Apart from providing flavor and preservation, pepper has many health benefits. Piperine is the main bioactive compound responsible for the pungent taste and health benefits of black pepper.

Black pepper has many health-boosting properties like antihypertensive, anti-Alzheimer's, antidepressant, antiplatelets, anti-inflammatory, antioxidant, antipyretic, antitumor, antiasthmatic, analgesic, antimicrobial, and many more.

Including a pinch of black pepper in your meal can increase the bioavailability of nutrients. It has the potential to strengthen our immune system. Black pepper stimulates HCl in the stomach and hence helps in better digestion. Black pepper is a good source of manganese which helps in improving bone health, wound healing, and metabolism.

4. Cinnamon (B Darfour & others 2014)

Cinnamon is an aromatic spice. Probably everyone has it on their shelves. It has been an integral part of Asian cooking. Cinnamon is prepared from the bark of its young branches. It is indeed a great addition to your food not just because of the flavor but also due to its therapeutic properties. Cinnamon has 21 chemical compounds with cinnamaldehyde (60.41%) and eugenol (3.19%),. which contributes to the antibacterial effects.

Cinnamon is a good source of antioxidants. It has antimicrobial, antiviral, antifungal, antioxidant, antihypertensive, antidiabetic,Antitumor properties. Apart from these properties, cinnamon also helps in conditions like headache, toothache, fever, colds, flatulence, diarrhea, etc. Higher doses of cinnamon can boost cell-mediated and humoral immunity.

5. Cardamom- (S Ilangatileke & others 2007)
Cardamom is a spice that has the potential of elevating the flavor of a savory/sweet dish instantly. It has a very distinct flavor. Adding elaichi(cardamom) to tea, sweets, biryani, curries is the most common practice in India. Cardamom is a fruit with a trilocular shell and contains 15-20 seeds. Use it as whole or ground, it does its job.

Other than being a fantastic spice, cardamom can also help in having good health. Daily consumption of cardamom can help in improving liver health in people withNonalcoholic fatty liver disease(NAFLD). Cardamom is high in antioxidants which may help in improving heart health. It also has anti-inflammatory, anti-bacterial properties and helps indigestion.

6. Ginger- (Bijaya Bag, 2018; R Offei-Okyne 2015; Purnomo H & others 2010)
Ginger has a very long history of culinary and medicinal use. It is native to Asia. The specific odor of ginger is due to its volatile oil constituents (1%- 3%). The phenols present in ginger (gingerols) are responsible for its pungency.

Consumption of ginger helps in fighting infectious diseases. The chemical compounds present in ginger help in fighting the bacteria like E. coli, Shigella. Gingerol can prevent the growth of oral bacterias that can cause periodontal disease. Ginger has anti-inflammatory properties which can help in arthritis. Taking ginger by mouth or putting on a ginger patch can help relieve the pain and swelling.

Ginger is a great source of antioxidants. It helps in high blood pressure, heart disease, and diseases of the lungs. Also, it can help against nausea, sore throat, constipation, etc. Some studies show that ginger can be effective in diabetes as it can help the body in using the insulin better.

7. Cumin (K Srinivasan 2018; Gulzar B 2018; Rebey IB & others 2014)
Cumin or as we call it jeera has been a part of our regular meals for years. Jeera rice is an all-time favorite of everybody. But, cumin has more to it than just providing flavor. Cumin seeds are ellipsoid, greenish-brown in color. The essential oils present in cumin are responsible for its bitter flavor and warm aroma. The main volatile components of cumin are cuminaldehyde, cymene, and terpenoids.

Cumin is a great source of antioxidants.It has been used to improve digestion for years. It can relieve irritable bowel syndrome symptoms like belly pain. The oil extract from cumin is effective against bacterial strains like E. coli, S. aureus, and S. faecalis. Cumin seeds also show anti-diabetic and anti-inflammatory properties. Also, they possess immunoregulatory activities.

All the spices mentioned above are used in different forms like fresh, dried, powdered, or extract form. The spices we buy from the store undergo certain processes to achieve the final product we get. These processes vary depending upon spice, end product, and intended use. Also, these processes can affect the nutritional profile of fresh spices. The following table shows the different processing steps and their effect on respective spices-

Table 2- Processing of spices

Sr no.	Spice	Processing Steps	Effect of processing
1.	Turmeric	1. Harvesting 2. Cleaning 3. Curing (open pan boiling) 4. Drying (sun drying, solar drying) 5. Polishing, crushing, and sieving 6. Packaging	An increase in the curing time of the turmeric rhizome results in a significant reduction of essential oils, oleoresins, curcumin, and starch.
2.	Garlic	1. Harvesting 2. Curing (forced air drying or using open trays, wired racks, bins in a well-ventilated room) 3. Bulb skin turns papery 4. Grading 5. Storage in a cool and dry place	The antioxidant content was significantly affected by heat treatment. Among all the thermal treatments mild roasting and microwave show better retention of bioactive compounds.
3.	Pepper	1. Harvesting 2. Threshing 3. Blanching (boiling water 1 min) 4. Drying (sun-drying) 5. Cleaning 6. Grading 7. Packaging 8. Storage	Sun-drying can be inefficient and cause microbial contamination as well as insect infestation. With the increase in time and temperature, Sun drying or mechanical drying shows a reduction in ascorbic acid, capsaicin, dihydrocapsaicin. New technologies like refractive window drying preserve nutritional properties.
4.	Cinnamon	1. Harvesting and trimming the stem 2. Scraping theouter skin 3. Rubbing 4. Peeling 5. Making quills 6. Drying 7. Storage	Various drying methods had different effects on the phytochemical composition of cinnamon. Sun-drying shows the degradation of total phenolic and total flavonoid content. Oven drying and freeze-drying can be a more effective methods.
5.	Cardamom	1. Harvesting 2. Cleaning 3. Curing (open pan boiling) 4. Drying (sun drying, solar drying) 5. Packaging	An increase in drying temperature highly affects the chlorophyll, essential oils, terpenoids content. Cardamoms pre-treated with 2 percent sodium carbonate and dried at 450C showed the highest retention of nutrients.
6.	Ginger	1. Harvesting and selecting ginger-based upon end use • 1.fresh consumption: 5 months • 2.preserved ginger: 5-7 months • 3. dried ginger: 8-9 months, • essential oil: 8-9 months 2. Cleaning 3. Sorting 4. Peeling 5. Packaging	Freeze drying can enhance the phenolic and flavonoid content of ginger. The total phenolic content of processed ginger is higher than non processed ginger. But, the free radical scavenging property is better in fresh ginger than processed. Either roasting or boiling for 6 minutes can show the best antioxidant effect.
7.	Cumin	Harvesting Drying Threshing and winnowing Grinding/packaging	The pungent and nutty flavor of cumin intensifies during roasting and heating. Various ripening stages and extraction methods affect total polyphenol, flavonoid, tannin, and antioxidant activities.

CHALLENGES IN OBTAINING APPROVAL OF NON-SPECIFIED FOODS

WEBINAR REPORT BY

Ms Prerana Patil,
Food Technologist, PFNDAI

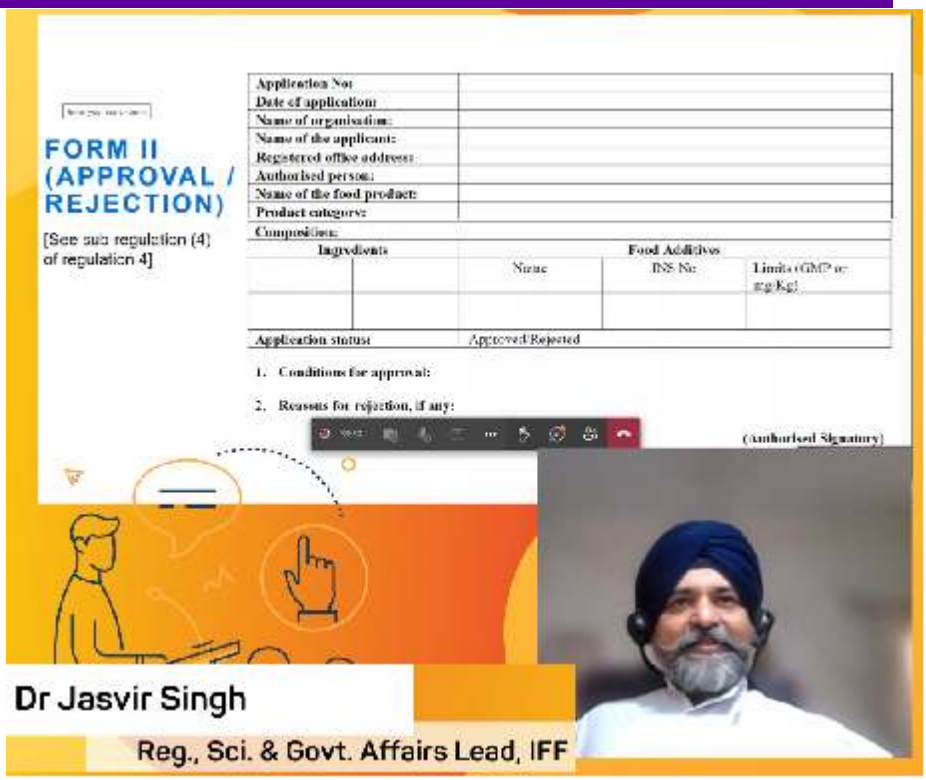
Protein Food And Nutrition Development Association of India (PFNDAI) conducted on 30th October 2021 a regulatory webinar on 'Challenges in Obtaining Approval of Non-Specified Foods'. The main objective of this webinar was to provide a platform to our participants for gaining knowledge about the approval of non-specified foods from experts in the field.

There were four presentations followed by a panel discussion. The speakers for the webinar were Dr. Jasvir Singh (Regulatory, Scientific & Government Affairs Lead, IFF), Ms. Sakshi Grover (Mgr. Strategic Services, Freyr Global Reg. Solutions & Services), Ms. Rini Sanyal (Director, Regulatory & Government Affairs, Herbalife Nutrition), and Ms. Meenu Yadav (Technical Reg. Affairs, Marico).

On the panel, there were Ms. Aparna Tandon Jain (Sr. Manager - Nutrition & NPD, Signutra), Ms. Shailesh Kumari (Senior Manager - Regulatory and Scientific Affairs, Nestlé), Mr. Phani Kumar (Head Quality & Regulatory, Zydus Wellness), and Dr. Akanksha (India Lead Scientific and Regulatory Affairs, Mars Petcare).

The webinar started with the welcome address by Dr. J. S. Pai (Executive Director, PFNDAI). The webinar was chaired and moderated by Dr. Joseph Lewis (Food Regulatory Consultant). He gave the opening remarks and introduced the participants to the topic of the webinar. In his remarks, he described the origin of this regulation by emphasizing the term "History of safe use'. Ms. Dolly Soni (Executive- Marketing & Digital, PFNDAI), introduced all the speakers before their respective presentations.

There is a lot of confusion when it comes to non-specified foods. Hence, the objective of this webinar was to enlighten our participants about the challenges that occur while obtaining approval of non-specified foods. For achieving this goal, four eminent speakers from the



regulatory field were invited along with four experts from the field as panelists. Every speaker expressed a different perspective in their respective presentations.

The webinar proceeded as follows-

1. Framework & Overview of Regulation By Dr. Jasvir Singh

The first speaker for the webinar was Dr. Jasvir Singh. He enlightened the participants regarding the framework of the regulation and provided an overview. He also highlighted the changes that were adopted in the Food Safety and Standards (Approval for non-specified foods and food ingredients) regulation, 2017. Here are some of the important points from his presentation-

• This regulation has a great amount of history. At first, there were no regulations for foods that have not been standardized. Hence a regulation called proprietory foods regulation came in which included many such non-standardized products. but still,many food products did not come under the proprietary food category. These food products are called non-specified foods. Therefore a regulation for the approval of such non-specified foods was developed.

• The final regulation was issued on 11 Sep 2017. The first draft for the amendment was issued on 22 September 2021 which is open for any comments till 21 November 2021.

• Non-specified foods are defined as any food other than proprietory food or food ingredient, including additives, processing aids, and enzymes for which standards have not been specifiedin any regulation made under the act.

• Under this act, the procedure consists of two forms. Form-I needs to be filled by the manufacturer for approval and Form-II indicates the acceptance/rejection of the food ingredient.

• Safety data relevant to the Indian population is mandatory to be submitted.

2. Regulatory Route For Novel Foods Globally And Challenges With India FSSAI- By Ms. Sakshi Grover

She explained various approval systems that exist globally for non-specified foods. And also explained the challenges with the FSSAI, India regulation for approval of non-specified foods. Here are some of the highlights from her presentation-

• The size of the global market for health foods is increasing with the rapid rise in innovation in food science. This highlights the importance of the regulations for the approval of non-specified foods.

• Many countries have developed systems for the assessment and approval of novel foods e. g. Canada (Health Canada), US (new dietary ingredient approval under FDA), EU (EFSA), China (NHFPC),

Australia/New Zealand (FSANZ), India (FSSAI).

• When it comes to approval of novel foods with FSSAI certain challenges may occur. Following are the challenges with the FSSAI approval process-

1. Ambiguity in regulation and various categories have been clubbed under NSF
2. Takes a long time to hear back on the application
3. Safety data on the Indian population is mandatory
4. Manufacturers/importers of the same ingredient that has been approved have to apply again until that ingredient is included in the regulation.
5. Limited guidance on dossier requirement
6. The international manufacturers can not apply without a local importer.

Ms. Sakshi Grover concluded her presentation by suggesting that the novel foods should be a different category as they are different from NSF.

3. Obtaining approval of Non-specified Foods - By Ms. Rini Sanyal

She explained the process of obtaining approval of non-specified foods. Ms. Rini Sanyal highlighted the following points in her presentation-

• It is necessary to have prior approval of non-specified foods before getting the license/registration.

• The approval procedure involves five steps (application, scrutiny, approval, certificate submission, and post-approval).

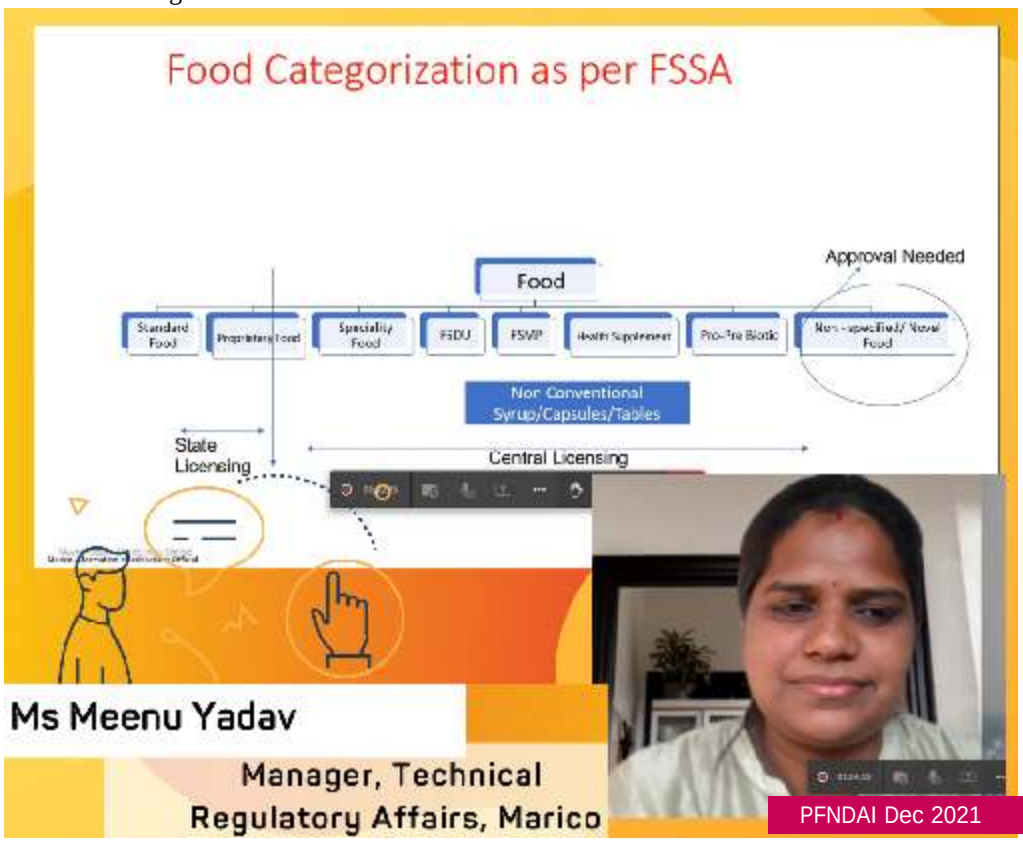
• Certain challenges may occur in the process of the non-specified food and food ingredients approval process like lack of infrastructure, documentation, non-specified timeline, inaccurate interpretation, and avertable requirements.

• Globally acceptable safe use should be used as a reference for including new ingredients

Ms. Rini Sanyal concluded her presentation by providing some resolutions to address the challenges that may occur with non-specified food approval.

4. Non-Specified Food Product Approval System- By Ms. Meenu Yadav

She enlightened the participants about the approval system for non-specified foods by sharing her views. Ms. Meenu Yadav highlighted the following points in her presentation- FSSAI is mandated under law to regulate/approve proprietory and novel food. So, to regulate effectively a set of the advisory was released.



Many challenges occur in the process of getting approval for non-specified foods. Following are the challenges that may occur-

1. Scope for the regulation of the non-specified food is not very clear
2. Repetitive approval is required for the same ingredient from different manufacturers.
3. Lack of a transparent and IT-enabled approval system
4. No specific timeline is provided for approval
5. All health and nutrient's claims need prior approval
6. A database management system is required for filtering out food as specified or non-specified

Ms. Meenu Yadav concluded her presentation by appreciating the efforts of FSSAI towards streamlining the approval process but also suggested that more efforts and changes are required.

Each presentation was followed by a question and answer session where the respective speaker answered the questions raised by the audience.

After the completion of all the expert talks, a panel discussion on the various aspects of Non-specified food approval was conducted. Pannel's discussion was moderated by Ms. Dolly Soni. In this panel discussion, the panel members shared their views about non-specified foods regulation and approval. Here are some of the topics which were discussed-

- Three types of permitted foods- standardized, proprietary, and non-specified foods
- Uncertainty of FBO's regarding product approval system for food products like citric acid
- Approval system for novel food and ingredients and processing aids in other countries
- The definition, examples, and the reason for regulating non-specified foods.

A short QnA sessional followed after the panel discussion to address some queries. The webinar concluded with the final remarks from Dr. Joseph Lewis anda vote of thanks by Ms. Dolly Soni.

REGULATORY ROUND UP

By
Dr. N. Ramasubramanian,
Director, VR FoodTech,
n.ram@vrfoodtech.com

Dear Readers

Please find below FSSAI notifications, advisories, orders, etc since the last round up. Please stay safe.

Notification

Final notification amending the standards of dehydrated vegetables, introducing new standards for multigrain atta, hemp products. Microbiological standards for cereal batters, doughs, etc.

Final regulation on the requirement of registration and inspection of foreign food manufacturers exporting to India. The Authority is yet to identify "high Risk" products which would require registration. It is open- ended and can be suitably extended. The process of registration involves inspection and it is assumed that the foreign manufacturer will have to pick up the tab. The regulation is very generic and as the saying goes, the devil is in the details. In my opinion, registration would have been sufficient. In any case, the importer or the representative of the foreign manufacturer is in India and can be held responsible.

Final notification amending the standard for Oat and Oat products

Draft Notification

Much awaited draft regulation on Genetically Modified or Genetically Engineered Foods. Some of the salient points are

• Genetically modified or engineered organisms or living modified organisms or ingredients derived from them can be imported and/or used only after the necessary approvals.

• Such live organisms must be approved first by the Genetic Engineering Appraisal Committee (GEAC) of the Ministry of Environment and then by FSSAI

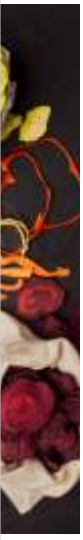
• Ingredients derived from such approved GMO are to obtain approval only from FSSAI.

• Application and approval process for GMO and ingredients derived from GMO are defined. However, timelines are not defined as is the wont in many FSSAI regulations.

• The scrutiny of the application will be done by the Food Authority. There is no mention of any special or expert committee for the process as the present composition of the Authority many not have necessary experts in the field.

• It is not clear whether oil derived from GM soy or maltodextrin derived from GM corn would come under GM - they do not contain protein or DNA

• Genetically Modified Organisms or Genetically Engineered Organisms or Living Modified Organisms shall not be used as an ingredient in any infant food.
• No prohibition in the use of ingredients derived from GMO in infant food.
• A food product containing ingredient from GMO at a level more than 1% to be labelled as "contains GM"
• No threshold level of GM ingredient to categorize a food as GM food. Like in EU, food containing less than 0.9% GM ingredient is not considered as a GM food.
• Laboratory testing procedures and conditions have been defined.



Comments and suggestions can be sent in prescribed format by 22 January 2022. A few comments have already been received and is published.
A draft notification amending Alcoholic Regulation, 2018 has been published.

Conditions for "Non-Alcoholic Beverages" imitating "Alcoholic Beverages" have been proposed.

Advisories, Orders and Clarifications.

Latest list of FSSAI recognized testing laboratories

Clarification with regard to nutrient content and health claims in blended oils. If a blend containing two oils A and B, then the document stipulates the conditions under which health claims with regard to A and B can be made.

It has been clarified that de oiled soybean or soybean meal meant for poultry feed do not fall under Food Safety and Standards Regulations and the Food Safety Officers are requested not to draw samples for analysis.

Appeal process under Approval of Non-Specified Food and Ingredients Regulation has been defined.

The first stage of appeal is with the Chief Executive Officer and finally with the Chairperson of FSSAI. The Chairperson's decision shall be final. Timelines for the disposal of appeals have been defined.

FSSAI has come out with a proposal to meet food business operators from different sectors to understand and address their concerns on a regular basis. The schedule has been published.

Conditions for the "Multi Sourced oils" or blended oils will not be applicable if such a blend is for the internal purpose or is meant for another FBO.

Import of Beef and Beef containing products is banned.

A process has been defined to shift existing user ids to new license number-based ids under FOSCOS system.
This would solve the problem of employees creating user id in their name and then leaving the organization.
Re operationalization of Licensing and Registration amendments issued in 2018.

RESEARCH IN HEALTH & NUTRITION

Good sleep-time recovery is associated with a healthier diet and lower alcohol consumption

Science Daily September 8, 2021

Good sleep-time recovery is associated with a health-promoting diet and health-promoting eating habits, as well as with lower consumption of alcohol, according to a new study investigating psychological and physiological well-being among working-age Finnish adults.

The association of physiological recovery with nutrition has been studied only scarcely. Published in Journal of Occupational Medicine and Toxicology, a new study now investigates whether physiological recovery during sleep relates to eating behaviour and diet quality.

The study population consisted of 252 psychologically distressed adults with overweight, who participated in a lifestyle intervention study in three Finnish cities. Their recovery was measured on the basis of sleep-time heart rate variability recorded on three consecutive nights. Heart rate variability was used to measure both parasympathetic and sympathetic activation of the autonomic nervous system, and their relation, i.e., the balance between stress and recovery. The parasympathetic nervous system plays a key role in recovery, during which heart rate is decreased and heart rate variability is high.

The study participants' eating behaviour was measured using four different questionnaires, and their diet quality and alcohol consumption was quantified using two different questionnaires and a 48-hour dietary recall. The aim was to explore the association between physiological recovery, diet quality, alcohol consumption and different aspects of eating behaviour, such as eating according to hunger and satiety cues. The present results are from the data collected at baseline before the lifestyle intervention.

According to the study, higher sleep-time parasympathetic activity, which is indicative of better physiological recovery, associates with more health-promoting diet quality and lower alcohol consumption, and possibly also with eating habits, especially factors affecting our decision to eat. Especially participants with a good stress balance reported better overall diet quality, higher fibre intake, stronger dietary self-control and lower alcohol consumption than those with a poorer stress balance.

However, the researchers point out that the cross-sectional study design allows no causality conclusions. In other words, it cannot be concluded from the results if better recovery leads to a healthier diet or if a healthy diet supports better recovery.

Diet may affect risk and severity of COVID-19

Study links healthy plant-based foods with lower risks of getting of COVID-19 and of having severe disease after infection

Science Daily September 8, 2021

Although metabolic conditions such as obesity and type 2 diabetes have been linked to an increased risk of COVID-19, as well as an increased risk of experiencing serious symptoms once infected, the impact of diet on these risks is unknown.

In a recent study led by researchers at Massachusetts General Hospital (MGH) and published in Gut, people whose diets were based on healthy plant-based foods had lower risks on both counts. The beneficial effects of diet on COVID-19 risk seemed especially relevant in individuals living in areas of high socioeconomic deprivation. "Previous reports suggest that poor nutrition is a common feature among groups disproportionately affected by the pandemic, but data on the association between diet and COVID-19 risk and severity are lacking," says lead author Jordi Merino, PhD, a research associate at the Diabetes Unit and Center for Genomic Medicine at MGH and an instructor in medicine at Harvard Medical School.

For the study, Merino and his colleagues examined data on 592,571 participants of the smart phone-based COVID-19 Symptom Study.

Participants lived in the UK and the US, and they were recruited from March 24, 2020 and followed until December 2, 2020. At the start of the study, participants completed a questionnaire that asked about their dietary habits before the pandemic. Diet quality was assessed using a healthful Plant-Based Diet Score that emphasises healthy plant foods such as fruits and vegetables.

During follow-up, 31,831 participants developed COVID-19. Compared with individuals in the lowest quartile of the diet score, those in the highest quartile had a 9% lower risk of developing COVID-19 and a 41% lower risk of developing severe COVID-19. "These findings were consistent across a range of sensitivity analysis accounting for other healthy behaviours, social determinants of health and community virus transmission rates," says Merino.

"Although we cannot emphasize enough the importance of getting vaccinated and wearing a mask in crowded indoor settings, our study suggests that individuals can also potentially reduce their risk of getting COVID-19 or having poor outcomes by paying attention to their diet," says co-senior author Andrew Chan, MD, MPH, a gastroenterologist and chief of the Clinical and Translational Epidemiology Unit at MGH.

The researchers also found a synergistic relationship between poor diet and increased socioeconomic deprivation with COVID-19 risk that was higher than the sum of the risk associated with each factor alone. "Our models estimate that nearly a third of COVID-19 cases would have been prevented if one of two exposures -- diet or deprivation -- were not present," says Merino.

The results also suggest that public health strategies that improve access to healthy foods and address social determinants of health may help to reduce the burden of the COVID-19 pandemic. "Our findings are a call to governments and stakeholders to prioritize healthy diets and wellbeing with impactful policies, otherwise we risk losing decades of economic progress and a substantial increase in health disparities," says Merino.

Scientists claim that overeating is not the primary cause of obesity

Science Daily
September 13, 2021

Statistics from the Centers for Disease Control and Prevention (CDC) show that obesity affects more than 40% of American adults, placing them at higher risk for heart disease, stroke, type 2 diabetes, and certain types of cancer.

The USDA's Dietary Guidelines for Americans 2020 -- 2025 further tells us that losing weight "requires adults to reduce the number of calories they get from foods and beverages and increase the amount expended through physical activity." This approach to weight management is based on the century-old energy balance model which states that weight gain is caused by consuming more energy than we expend. In today's world, surrounded by highly palatable, heavily marketed, cheap processed foods, it's easy for people to eat more calories than they need, an imbalance that is further exacerbated by today's sedentary lifestyles. By this thinking, overeating, coupled with insufficient physical activity, is driving the obesity epidemic. On the other hand, despite decades of public health messaging exhorting people to eat less and exercise more, rates of obesity and obesity-related diseases have steadily risen.

The authors of "The Carbohydrate-Insulin Model: A Physiological Perspective on the Obesity Pandemic," a perspective published in The American Journal of Clinical Nutrition, point to fundamental flaws in the energy balance model, arguing that an alternate model, the carbohydrate-insulin model, better explains obesity and weight gain. Moreover, the carbohydrate-insulin model points the way to more effective, long-lasting weight management strategies.

According to lead author Dr. David Ludwig, Endocrinologist at Boston Children's Hospital and Professor at Harvard Medical School, the energy balance model doesn't help us understand the biological causes of weight gain: "During a growth spurt, for instance, adolescents may increase food intake by 1,000 calories a day. But does their overeating cause the growth spurt or does the growth spurt cause the adolescent to get hungry and overeat?"

In contrast to the energy balance model, the carbohydrate-insulin model makes a bold claim: overeating isn't the main cause of obesity. Instead, the carbohydrate-insulin model lays much of the blame for the current obesity epidemic on modern dietary patterns characterized by excessive

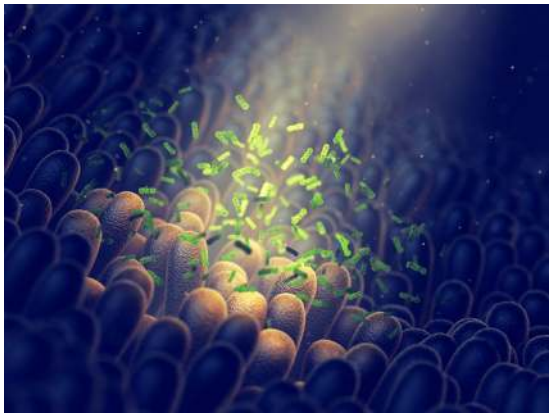
consumption of foods with a high glycemic load: in particular, processed, rapidly digestible carbohydrates. These foods cause hormonal responses that fundamentally change our metabolism, driving fat storage, weight gain, and obesity.

When we eat highly processed carbohydrates, the body increases insulin secretion and suppresses glucagon secretion. This, in turn, signals fat cells to store more calories, leaving fewer calories available to fuel muscles and other metabolically active tissues. The brain perceives that the body isn't getting enough energy, which, in turn, leads to feelings of hunger. In addition, metabolism may slow down in the body's attempt to conserve fuel. Thus, we tend to remain hungry, even as we continue to gain excess fat.

To understand the obesity epidemic, we need to consider not only how much we're eating, but also how the foods we eat affect our hormones and metabolism. With its assertion that all calories are alike to the body, the energy balance model misses this critical piece of the puzzle.

While the carbohydrate-insulin model is not new -- its origins date to the early 1900s -- The American Journal of Clinical Nutrition perspective is the most comprehensive formulation of this model to date, authored by a team of 17 internationally recognized scientists, clinical researchers, and public health experts. Collectively, they have summarized the growing body of evidence in support of the carbohydrate-insulin model. Moreover, the authors have identified a series of testable hypotheses that distinguish the two models to guide future research.

Adoption of the carbohydrate-insulin model over the energy-balance model has radical implications for weight management and obesity treatment. Rather than urge people to eat less, a strategy which usually doesn't work in the long run, the carbohydrate-insulin model suggests another path that focuses more on what we eat. According to Dr. Ludwig, "reducing consumption of the rapidly digestible carbohydrates that flooded the food supply during the low-fat diet era lessens the underlying drive to store body fat. As a result, people may lose weight with less hunger and struggle."



Gut microbiota influences the ability to lose weight

Science Daily September 14, 2021

Gut microbiota influences the ability to lose weight in humans, according to new research. The findings were published this week in mSystems, an open-access journal of the American Society for Microbiology.

"Your gut microbiome can help or cause resistance to weight loss and this opens up the possibility to try to alter the gut microbiome to impact weight loss," said lead study author Christian Diener, Ph.D., a research scientist at the Institute for Systems Biology in Seattle, Washington.

To conduct their research, Dr. Diener and colleagues focused on a large cohort of individuals who were involved in a lifestyle intervention study. Instead of a specific diet or exercise program, this intervention involved a commercial behavioural coaching program paired with advice from a dietician and nurse coach. The researchers focused on 48 individuals who lost more than 1% of their body weight per month over a 6 to 12 month period and 57 individuals who did not lose any weight and had a stable body mass index (BMI) over the same period. The researchers relied on metagenomics, the study of genetic material recovered from blood and stool samples. The individuals analyzed blood metabolites, blood proteins, clinical labs, dietary questionnaires and gut bacteria in the two groups.

After controlling for age, sex and baseline BMI, the researchers identified 31 baseline stool metagenomic functional features that were associated with weight loss responses. These included complex polysaccharide and protein degradation genes, stress-response genes, respiration-related genes, cell wall synthesis genes and gut bacterial replication rates. A major finding was that the ability of the gut microbiome to break down starches was increased in people who did not lose weight. Another key finding was that genes that help bacteria grow faster, multiply, replicate and assemble cell walls were increased in people who lost more weight.

"Before this study, we knew the composition of bacteria in the gut were different in obese people than in people who were non-obese, but now we have seen that there are a different set of genes that are encoded in the bacteria in our gut that also responds to weight loss interventions," said Dr. Diener. "The gut microbiome is a major player in modulating whether a weight loss intervention will have success or not. The factors that dictate obesity versus non-obesity are not the same factors that dictate whether you will lose weight on a lifestyle intervention." Research has already shown that if you change your diet, you can alter the composition of bacteria in your gut. According to Dr. Diener, if someone has a composition of gut bacterial genes that confers resistance to weight loss, then perhaps you can alter their diet to shift to a composition that would help them lose weight.

New findings on ambient UVB radiation, vitamin D, and protection against severe COVID-19

Science Daily September 15, 2021

New research from Trinity College Dublin and University of Edinburgh has examined the association between vitamin D and COVID-19, and found that ambient ultraviolet B (UVB) radiation (which is key for vitamin D production in the skin) at an individual's place of residence in the weeks before COVID-19 infection, was strongly protective against severe disease and death.

The paper has been published in the journal Scientific Reports.

Previous studies have linked vitamin D deficiency with an increased susceptibility to viral and bacterial respiratory infections. Similarly, several observational studies found a strong correlation between vitamin D deficiency and COVID-19, but it could be that these effects are confounded and in fact a result of other factors, such as obesity, older age or chronic illness which are also linked with low vitamin D. To overcome this, researchers were able to calculate "genetically-predicted" vitamin D level, that is not confounded by other demographic, health and lifestyle factors, by using the information from over one hundred genes that determine vitamin D status.

The Mendelian Randomisation is a particular analytical approach that enabled researchers to investigate whether vitamin D and COVID-19 might be causally linked using genetic data. Few earlier studies attempted this but failed to show a causal link. This could be because UVB radiation sunshine which is the most important source of vitamin D for majority of people was ignored.

Researchers, for the first time, looked jointly at genetically-predicted and UVB-predicted vitamin D level. Almost half a million individuals in the UK took part in the study, and ambient UVB radiation before COVID-19 infection was individually assessed for each participant. When comparing the two variables, researchers found that correlation with measured vitamin D concentration in the circulation was three-fold stronger for UVB-predicted vitamin D level, compared to genetically-predicted.

Researchers found that ambient UVB radiation at an individual's place of residence preceding COVID-19 infection was strongly and inversely associated with hospitalisation and death. This suggests that vitamin D may protect against severe COVID-19 disease and death. Additionally, while the results from the Mendelian Randomisation analysis weren't conclusive, some indication of a potential causal effect was noted. Because of the relatively weak link between genetically-predicted vitamin D level that is used for Mendelian Randomisation analysis, it is possible that the number of cases in the current study was too small to convincingly determine causal effect, but future larger studies might provide the answer.

Professor Lina Zgaga, Associate Professor in Epidemiology, School of Medicine, Trinity College and senior researcher on the study said: "Our study adds further evidence that vitamin D might protect against severe COVID-19 infection. Conducting a properly designed COVID-19 randomised controlled trial of vitamin D supplementation is critical. Until then, given that vitamin D supplements are safe and cheap, it is definitely advisable to take supplements and protect against vitamin D deficiency, particularly with winter on the horizon."

Professor Evropi Theodoratou, Professor of Cancer Epidemiology and Global Health, University of Edinburgh and senior researcher on the study said: "Given the lack of highly effective therapies against COVID-19, we think it is important to remain open-minded to emerging results from rigorously conducted studies of vitamin D."

Dr Xue Li, a researcher on the study from Zhejiang University said: "Our study supports the recommendation of vitamin D supplementation for not only the maintenance of bone and muscle health during the lock down, but also the potential benefits in relation to protection from COVID-19."

Is your child a fussy eater?

Science Daily
September 21, 2021

Whether it's an exclusive appetite for 'white' foods or an all-out refusal on veggies, when you have a fussy eater on your hands, mealtime can be more than a challenge.

While picky eating is all part of the norm for developing toddlers, when it extends into school years, it takes a toll on all involved, children and parents alike. Now, new research from USC, the University of South Australia, and the University of Queensland is providing a better understanding of what influences fussy eaters, and what is more likely to increase or decrease picky eating in children under 10. Reviewing 80 health industry studies, the research found that a range of factors contributed to a child's likelihood of being a fussy eater.

The study found that pressuring a child to eat, offering rewards for eating, very strict parenting all negatively influenced fussy eaters. Conversely, a more relaxed parenting style, eating together as a family, and involving a child in the preparation of food all reduced the likelihood of fussy eating.

Lead researcher and USC PhD student Laine Chilman says the research hopes to help parents and carers better understand fussy eating in children.

"For parents with a fussy eater, mealtimes can be especially stressful -- juggling the family meal and a picky eater is no small feat," Chilman says. "Some families have kids who turn their noses up at any vegetable. Others are dealing with kids who dislike certain textures or colours of food. "Some of these preferences relate to a child's characteristics or personality, which are difficult to change, if at all. But others are external factors that could help reduce fussy eating in kids.

"Eating together as a family, with siblings, and having a single meal at a regular time all helped reduce food fussiness. As did getting the fussy child involved in the meal, either by helping to choose the menu, or helping to prepare the meal. "Yet if fussy eaters were allowed to eat in front of the TV, or if they were rewarded for eating certain foods, these behaviours negatively influenced picky children." According to the Australian Nutrition and Physical Activity Survey, most children do not meet recommended diet and nutrition guidelines.

UniSA researcher Dr Ann Kennedy-Behr says stress can contribute to fussy eating.
"When you have a child who is a picky eater, it's very stressful for a parent or carer -- they're forever questioning whether their child is getting enough nutrients, enough food, and often enough weight gain," Dr Kennedy-Behr says. "Yet it's important to understand that being overtly anxious or worried can actually contribute to increased picky eating. "Avoiding getting cross and limiting any negativity around mealtime will be benefit everyone. "Positive parenting, no matter how difficult it can be in certain situations, is the best step forward for fussy eaters."

Top tips to help a fussy eater
1. Set a good example: a family that eats together has better eating habits
2. Schedule regular mealtimes: regular mealtimes reduce levels of stress.
3. Get kids involved with food preparation: familiarity and a sense of control can help
4. Try to have one mealtime: a separate kids' sitting encourages fussy eating
5. Turn the TV off: focus on food, not on screens
6. Try to keep mealtimes calm and stress free: will be a better experience for all.
7. Remove rewards or bribes or punishments for fussy eaters.

MIND diet linked to better cognitive performance
Study finds diet may contribute to cognitive resilience in the elderly

Science Daily September 21, 2021

Aging takes a toll on the body and on the mind. For example, the tissue of aging human brains sometimes develops abnormal clumps of proteins that are the hallmark of Alzheimer's disease. How can you protect your brain from these effects?

Researchers at Rush University Medical Center have found that older adults may benefit from a specific diet called the MIND diet even when they develop these

protein deposits, known as amyloid plaques and tangles. Plaques and tangles are a pathology found in the brain that build up in between nerve cells and typically interfere with thinking and problem-solving skills. Developed by the late Martha Clare Morris, ScD, who was a Rush nutritional epidemiologist, and her colleagues, the MIND diet is a hybrid of the Mediterranean and DASH (Dietary Approaches to Stop Hypertension) diets. Previous research studies have found that the MIND diet may reduce a person's risk of developing Alzheimer's disease dementia.

Now a study has shown that participants in the study who followed the MIND diet moderately later in life did not have cognition problems, according to a paper published on Sept. 14 in the Journal of Alzheimer's Disease. "Some people have enough plaques and tangles in their brains to have a post-mortem diagnosis of Alzheimer's disease, but they do not develop clinical dementia in their lifetime," said Klodian Dhana, MD, PhD, lead author of the paper and an assistant professor in the Division of Geriatrics and Palliative Medicine in the Department of Internal Medicine at Rush Medical College.

"Some have the ability to maintain cognitive function despite the accumulation of these pathologies in the brain, and our study suggests that the MIND diet is associated with better cognitive functions independently of brain pathologies related to Alzheimer's disease.

In this study, the researchers examined the associations of diet -- from the start of the study until death -- brain pathologies and cognitive functioning in older adults who participated in the Rush Alzheimer's Disease Center's ongoing Memory and Aging Project, which began in 1997 and includes people living in greater Chicago.

The participants were mostly white without known dementia, and all of them agreed to undergo annual clinical evaluations while alive and brain autopsy after their death. The researchers followed 569 participants, who were asked to complete annual evaluations and cognitive tests to see if they had developed memory and thinking problems. Beginning in 2004, participants were given an annual food frequency questionnaire about how often they ate 144 food items in previous year.
Using the questionnaire answers, the researchers gave each participant a MIND diet score based on how often the participants ate specific foods. The MIND diet has 15 dietary components, including 10 "brain-healthy food groups" and five unhealthy groups -- red meat, butter and stick margarine, cheese, pastries and sweets, and fried or fast food.
To adhere to and benefit from the MIND diet, a person would need to eat at least three servings of whole grains, a green leafy vegetable and one other vegetable every day -- along with a glass of wine -- snack most days on nuts, have beans every other day or so, eat poultry and berries at least twice a week and fish at least once a week. A person also must limit intake of the designated unhealthy foods, limiting butter to less than 1 1/2 teaspoons a day and eating less than a serving a week of sweets and pastries, whole fat cheese, and fried or fast food.

Based on the frequency of intake reported for the healthy and unhealthy food groups, the researchers calculated the MIND diet score for each participant across the study period. An average of the MIND diet score from the start of the study until the participant's death was used in the analysis to limit measurement error. Seven sensitivity measures were calculated to confirm accuracy of the findings.

"We found that a higher MIND diet score was associated with better memory and thinking skills independently of Alzheimer's disease pathology and other common age-related brain pathologies. The diet seemed to have a protective capacity and may contribute to cognitive resilience in the elderly." Dhana said. “Diet changes can impact cognitive functioning and risk of dementia, for better or worse," he continued. "There are fairly simple diet and lifestyle changes a person could make that may help to slow cognitive decline with aging, and contribute to brain health.”

Adjusting fatty acid intake may help with mood variability in bipolar disorders

Science Daily September 23, 2021

Can specific dietary guidelines help people living with bipolar disorders better manage their health? Maybe someday, according to a new study by Penn State College of Medicine researchers.

Clinical trial results showed that a diet designed to alter levels of specific fatty acids

consumed by participants may help patients have less variability in their mood.

Bipolar disorders, which affect up to 2.4% of the population, are mental health conditions where individuals experience cyclic and abnormally elevated and/or depressed mood states. During acute episodes, parts of the brain that regulate emotions are underactive, leading to either manic highs or depressive lows. Researchers are identifying ways to help patients with the symptoms they experience between episodes, which can include pain, anxiety, impulsivity and irritability.

"As clinicians, we understand that if we can help our patients better control these symptoms between episodes, it could help reduce the number of times they relapse into acute episodes," said Dr. Erika Saunders, Shively-Tan Professor and chair of the Department of Psychiatry and Behavioral Health at Penn State Health Milton S. Hershey Medical Center. "Our goal with this trial was to see if specific dietary interventions could help patients with mood variability between episodes."

Saunders and her colleagues designed a diet to alter the levels of specific polyunsaturated fatty acids -- nutrients found in many foods -- participants consumed while participating in usual care for bipolar disorders, including mood-stabilizing medication. Prior research showed that medications for treating bipolar disorders change the way bodies break down, or metabolize, fatty acids. The by-products of this process activate different parts of the immune system and include other chemical processes that affect how the body perceives pain, a common symptom reported by people living with bipolar disorders.

The researchers hypothesized that by changing the type and amount of fatty acids consumed, the body would generate metabolites with specific purposes, such as reducing pain or inflammation. The experimental diet decreased omega-6 fatty acid consumption by limiting red meat, eggs and certain oils, and increased omega-3 fatty acid consumption by adding flax seed and fatty fishes like tuna and salmon. To keep participants unaware of which group they were in, the team gave participants specific meal plans with instructions on how to prepare their food as well as unlabeled cooking oils and specially prepared snack foods and baked products.

More than 80 people with bipolar disorders participated in diet counselling and they were given specific foods to eat for a 12-week period. Twice a day they completed surveys on their mobile devices about their mood, pain and other symptoms. Throughout the study participants also had blood work taken so researchers could measure fatty acid levels and how the food was affecting their bodies. According to the researchers, the experimental diet improved mood variability in patients with bipolar disorders. The results were published in the journal Bipolar Disorders.

"At this time, we can't yet recommend this type of diet for patients with bipolar disorders, although we found the diet to be safe," said Saunders, noting that follow-up studies are needed. "This carefully constructed nutrition plan shows promise for regulating mood between manic and depressive episodes, but we're not sure if this could be widely adopted since it would be challenging for patients to follow this rigorous program."

In the future, the research team will continue to assess how fatty acid metabolites may affect pain in bipolar disorders. Saunders said that by replicating the study, they hope to make sound, scientific dietary recommendations for people with bipolar disorders that could be more easily implemented in their everyday lives.

"This diet isn't meant to be a treatment for people with bipolar disorders who are experiencing acute, severe depression or mania," Saunders said. "Rather, our goal is to develop solutions to help patients have better long-term management of their symptoms, including pain."

Children who eat more fruit and veggies have better mental health

Science Daily September 28, 2021

Children who eat a better diet, packed with fruit and vegetables, have better mental wellbeing -- according to new research from the University of East Anglia.

A new study published today is the first to investigate the association between fruit and vegetable intakes, breakfast and lunch choices, and mental wellbeing in UK school children. It shows how eating more fruit and veg is linked with better wellbeing among secondary school pupils in particular. And children who consumed five or more portions of fruit and veg a day had the highest scores for mental wellbeing. The study was led by UEA Health and Social Care Partners in collaboration with Norfolk County Council.

The research team say that public health strategies and school policies should be developed to ensure that good quality nutrition is available to all children before and during school to optimise mental wellbeing and empower children to fulfil their full potential. Lead researcher Prof Ailsa Welch, from UEA's Norwich Medical School, said: "We know that poor mental wellbeing is a major issue for young people and is likely to have long-term negative consequences. "The pressures of social media and modern school culture have been touted as potential reasons for a rising prevalence of low mental wellbeing in children and young people.

"And there is a growing recognition of the importance of mental health and wellbeing in early life -- not least because adolescent mental health problems often persist into adulthood, leading to poorer life outcomes and achievement. "While the links between nutrition and physical health are well understood, until now, not much has been known about whether nutrition plays a part in children's emotional wellbeing. So, we set out to investigate the association between dietary choices and mental wellbeing among schoolchildren." The research team studied data from almost 9,000 children in 50 schools across Norfolk (7,570 secondary and 1,253 primary school children) taken from the Norfolk children and Young People's Health and wellbeing Survey. This survey was commissioned by the Public Health department of Norfolk County Council and the Norfolk Safeguarding Children Board. It was open to all Norfolk schools during October 2017. Children involved in the study self-reported their dietary choices and took part in age-appropriate tests of mental wellbeing that covered cheerfulness, relaxation, and having good interpersonal relationships. Prof Welch said: "In terms of nutrition, we found that only around a quarter of secondary-school children and 28 per cent of primary-school children reported eating the recommended five-a-day fruits and vegetables. And just under one in ten children were not eating any fruits or vegetables. "More than one in five secondary school children and one in 10 primary children didn't eat breakfast. And more than one in 10 secondary school children didn't eat lunch.

The team looked at the association between nutritional factors and mental wellbeing and took into account other factors that might have an impact -- such as adverse childhood experiences and home situations. Dr Richard Hayhoe, also from UEA's Norwich Medical School, said: "We found that eating well was associated with better mental wellbeing in children. And that among secondary school children in particular, there was a really strong link between eating a nutritious diet, packed with fruit and vegetables, and having better mental wellbeing. "We also found that the types of breakfast and lunch eaten by both primary and secondary school pupils were also significantly associated with wellbeing. "Children who ate a traditional breakfast experienced better wellbeing than those who only had a snack or drink. But secondary school children who drank energy drinks for breakfast had particularly low mental wellbeing scores, even lower than for those children consuming no breakfast at all. "According to our data, in a class of 30 secondary school pupils, around 21 will have consumed a conventional-type breakfast, and at least four will have had nothing to eat or drink before starting classes in the morning. "Similarly, at least three pupils will go into afternoon classes without eating any lunch. This is of concern, and likely to affect not only academic performance at school but also physical growth and development. "Another interesting thing that we found was that nutrition had as much or more of an impact on wellbeing as factors such as witnessing regular arguing or violence at home.

Prof Welch said: "As a potentially modifiable factor at an individual and societal level, nutrition represents an important public health target for strategies to address childhood mental wellbeing. "Public health strategies and school policies should be developed to ensure that good quality nutrition is available to all children both before and during school in order to optimise mental wellbeing and empower children to fulfil their full potential."

Fish oils for forgetfulness? Omega 3 intake linked to stabilized memory in Alzheimer's study

08 Sep 2021 Nutrition Insight

Researchers in Sweden have found a positive correlation between omega 3 intake and memory in Alzheimer's patients who performed a cognitive test. The study is hailed as the first ever to measure biomarkers from spinal fluid in Alzheimer's patients treated with omega 3 fatty acids.

"We can see that the memory function of the patients in the group that had taken omega 3 is stable, whereas the patients in the control group have deteriorated," says Yvonne Freund-Levi, a researcher in neuroscience at Örebro University who collaborated with researchers at Karolinska Institute, Sahlgrenska University Hospital and Uppsala

University on the study. "But we can't see any differences between the groups when we look at the various biomarkers in the spinal fluid samples." When looking solely within the group that took omega 3, participants' spinal fluid revealed an increase in two biomarkers associated with damaged nerve cells: neurofilament light (NfL) and chitinase-3-like protein 1 (YKL-40). Researchers point out that these could indicate an increase in the inflammatory response, but more research is needed, particularly given the study's small size. Patients who took omega 3 supplements at an early stage of Alzheimer's disease scored better on memory tests, notes neuroscience researcher Freund-Levi.

Measuring the outcomes

The study published in the Journal of Alzheimer's Disease was a post hoc study that consisted of 33 Alzheimer's patients – 18 of which were given omega 3 supplements during the morning and evening, and 15 made up the control group. Omega 3 supplements were sourced from fish oils, dosed at 2.3 g, with a higher content of DHA than EPA, Freund-Levi tells NutritionInsight. Spinal fluid samples were collected, and patients performed a memory test – both at the start of the study and after six months. No differences were detected between the groups at baseline. The recent study is based on a larger study with over 200 patients with mild to moderate Alzheimer's disease, initiated by Yvonne Freund-Levi and her research team 15 years ago. In that study, the researchers examined – among other benchmarks – whether omega 3 transfers from the supplements to the brain and concluded that that was indeed the case.

To recommend or not to recommend?

More research will be needed to conclude omega 3's impact on Alzheimer's, Yvonne Freund-Levi notes. Before recommendations to patients can be updated, she remarks that it is "interesting material for researchers to build on." Biomarkers showed no significant differences between Alzheimer's patients who took omega 3s versus the control group. "We are cautious about giving recommendations, but we know that starting early is by far the best thing – it is difficult to influence the disease at a later stage." However, she recommends being physically active and including omega 3 in the diet – in the form of oily fish or as supplements. "We can see a difference in the results of the memory tests. Patients who were taking omega 3 supplements at an early stage of the disease scored better," she says.

Next steps

A major step forward is that researchers in the future will be able to examine the biomarkers in blood samples rather than having to perform spinal tap procedures on the patients. Yvonne Freund-Levi adds: "We have already tested this approach at Sahlgrenska University Hospital. Without a doubt, it is so much better for the patients."
As research moves forward to reveal the health benefits of omega 3s, industry experts have flagged that lesser-known types of omega 3s, such as ALA, merit more investigation and "omegas 6, 7 and 9 should not be forgotten." As demand is evident, formulators have been focusing on developing more sustainable solutions to meet the demand for omega 3s, including plant-based sources and valorized tuna heads.

By Missy Green

Healthy gut microbiome essential for post-exercise muscle growth, study finds

27 Sep 2021 Nutrition Insight

A healthy gut microbiome is necessary for skeletal muscles to fully grow after exercise, according to a study from the University of Kentucky, US. The study findings suggest the gut microbiome makes substances that help skeletal muscles to become larger after exercising.

The study further contributes to the growing body of evidence showing a connection between the gut microbiome and skeletal muscles. "If we can identify the substances that gut bacteria are making to help muscles grow after exercise, we might be able to use some of those substances to promote the growth of muscles in people suffering from the loss of muscle as typically seen with aging or cancer," explains Taylor Valentino, first study author. From an athletic standpoint, world-class runners were found to have more of a particular type of bacteria that provided an additional source of energy, which was thought to help them run faster. "Thus, the gut microbiome makes substances that appear to be important for skeletal muscles to fully adapt to exercise as well as help improve athletic performance," says John McCarthy, senior study author. The microbiome may promote muscle growth in muscle loss conditions such as aging and cancer. The study found that the muscles of mice without an intact microbiome did not grow as much as the muscles of healthy mice, even though both groups of mice ran the same amount over the nine weeks of wheel running.

The microbiome and skeletal muscles

Previous studies suggest the gut microbiome may be necessary for the health of skeletal muscles. Therefore the researchers wanted to determine if a healthy gut microbiome is essential for skeletal muscle to adapt to exercise. "We are currently trying to determine how exercise changes the composition

and function of the gut microbiome. This investigation, along with other studies in bacteria, will allow us to identify the substances made by the gut microbiome that help the skeletal muscle to grow larger in response to exercise," adds McCarthy.

To study this further, the researchers let mice voluntarily exercise on running wheels every day for nine weeks, with some mice administered antibiotics through their drinking water. The antibiotic treatment killed the bacteria of the gut microbiome. They then compared healthy mice's muscles to those without an intact microbiome to see if the muscles adapted differently to wheel running.

Study limitations

Although the researchers used a relatively low dose of antibiotics compared to previous studies, a limitation of the study is that the researchers do not know if the antibiotics might have directly affected the ability of the skeletal muscle to adapt to exercise. The researchers found that an intact microbiome was necessary in mice for muscles to grow following exercise. The initial research was conducted using only female mice. Therefore researchers do not know if the findings will be the same in male mice. Finally, as with all animal studies, it is unclear whether or not the results will translate into humans.

Industry players have shown interest in the potential of probiotics and vitamins for muscle health. In March, Hum Nutrition unveiled Core Strength, a protein powder that includes a blend of flaxseeds and probiotics to help build lean muscle. Meanwhile, researchers from the UK found that vitamin C holds potential in muscle maintenance for elderly populations. A separate study supported by TSI found that muscle loss in the elderly was minimized through a combination of beta-hydroxy beta-methyl butyrate (HMB) and vitamin D. Edited by Nicole Kerr

Eating less fat may save your hair

Science Daily
September 21, 2021

It's well known that obesity is linked to the development of numerous diseases in humans.

Heart disease, diabetes, and other ailments are extremely common in obese individuals. However, it's not fully clear how body organs specifically deteriorate and lose functionality from chronic obesity. In a recent article published in Nature, a group of researchers from Tokyo Medical and Dental University (TMDU) used mouse model experiments to examine how a high-fat diet or genetically induced obesity can affect hair thinning and loss. The authors found that obesity can lead to depletion of hair follicle stem cells (HFSCs) through the induction of certain inflammatory signals, blocking hair follicle regeneration and ultimately resulting in loss of hair follicles.

Normally, HFSCs self-renew every hair follicle cycle. This is part of the process that allows our hair to continuously grow back. As humans age, HFSCs fail to replenish themselves leading to fewer HFSCs and therefore hair thinning. Although overweight people has higher risk of androgenic alopecia, whether obesity accelerates hair thinning, how and the molecular mechanisms have been largely unknown. The TMDU group aimed to address those questions and identified some of the mechanisms.

"High-fat diet feeding accelerates hair thinning by depleting HFSCs that replenish mature cells that grow hair, especially in old mice." says lead author of the study Hironobu Morinaga. "We compared the gene expression in HFSCs between HFD-fed mice and standard diet-fed mice and traced the fate of those HFSCs after their activation. "We found that those HFSCs in HFD-fed obese mice change their fate into the skin surface corneocytes or sebocytes that secrete sebum upon their activation. Those mice show faster hair loss and smaller hair follicles along with depletion of HFSCs."

"Even with HFD feeding in four consecutive days, HFSCs shows increased oxidative stress and the signs of epidermal differentiation."

"The gene expression in HFSCs from the high-fat-fed mice indicated the activation of inflammatory cytokine signalling within HFSCs" describes Emi K. Nishimura, senior author. "The inflammatory signals in HFSCs strikingly repress Sonic hedgehog signalling that plays crucial role in hair follicle regeneration in HFSCs.
The researchers confirmed the activation of the Sonic hedgehog signalling pathway in this process can rescue the depletion of HFSCs. "This could prevent the hair loss brought on by the high-fat diet. "said Nishimura.

This study provides interesting new insights into the specific cellular fate changes and tissue dysfunction that can occur following a high-fat diet or genetically induced obesity and may open the door for future prevention and treatment of hair thinning as well as for understanding of obesity-related diseases.

FOOD SCIENCE & INDUSTRY NEWS

Reducing salt in bread without sacrificing taste

Science Daily September 28, 2021

Most people in the U.S. consume too much salt; adult Americans typically eat twice the daily amount recommended by dietary guidelines. Bread may not seem like an obvious culprit; however, due to high consumption and relatively high salt content, baked goods are a major source of sodium in the diet. A new study from the University of Illinois explores ways to reduce sodium in bread without sacrificing taste and leavening ability.

"Bread is one of the staple foods in a lot of people's diets, and people generally don't stick to just one serving of bread," says Aubrey Dunteman, graduate student in the Department of Food Science and Human Nutrition at U of I, and lead author on the paper. "About 70% of sodium in the U.S. food supply comes from packaged and processed foods. And the top source is actually baked goods, so reducing salt in that particular category would help to reduce sodium consumption tremendously," adds study co-author Soo-Yeun Lee, professor of food science at U of I.

We can't completely eliminate salt from our diet, but we can reduce it to a healthier level. "Salt is an essential nutrient, and this is why we crave it. However, we consume more than we should, just like sugar and fat. Salt is related with hypertension and other cardiovascular diseases, but it's the amount that is the problem, not the salt itself," Lee notes. Salt is also an essential ingredient in bread making; it contributes to the structure and flavour of the bread, and is necessary for the yeast to work properly.

Dunteman and Lee conducted an extensive review of academic literature on sodium reduction in bread. They identified four main categories: Salt reduction without any further mitigation, physical modification, sodium replacements, and flavor enhancers. They discuss each of these methods in their paper, published in the International Journal of Food Science and Technology. "The most basic method is just reducing the amount of salt in the product," Dunteman says. "That can be good to a point, depending on the original level of salt and equivalent in the recipe. There's always going to be a minimum amount of salt you need just to have the bread function and the yeast do its job. So it's a limited method, but it can help to reduce high levels of sodium intake."

Another method is physical modification, which involves uneven distribution of salt in the product. "Sensory adaptation occurs when you have constant stimulus. If the salt is evenly distributed in a slice of bread, as you take more bites, it's going to taste less salty, because you're already adapted to the first few bites. But if you have different distribution of salt, alternating between densely and lightly salted layers, people will perceive it as more salty. So you can obtain the same taste effect with less salt," Lee explains.

A third method involves replacement of sodium with other substances, such as magnesium chloride, calcium chloride, or potassium chloride. "This is one of the most commonly used methods in industry, but it can only be used up to a certain point, before you get a bit of a metallic taste from these compounds," Dunteman points out.

The fourth method involves flavour modification with taste enhancers such as herbs and spices, or even monosodium glutamate (MSG). The researchers note multi-grain bread also allows for more salt reduction than white bread, because it has more flavour on its own.

Finally, the researchers have some advice for home bakers looking to reduce sodium in their creations. "If you're interested in using less salt in your home-baked bread, you could try to reduce the amount to 50%, if you're using standard recipes that are widely available," Lee says. "You'd be surprised that the dough would still rise, though the bread would taste a little different. You can also use flavour enhancers to provide the salty, savoury, satiating sensation you lose when you reduce the salt. But that wouldn't help with the rise, so you cannot remove salt 100%."

Coffee and the Effects of Climate Change

A collaborative study looks at how changing climate conditions might be affecting the taste, aroma, and overall quality of coffee

By Lisa LaPoint Tufts Now October 26, 2021

Whether you prefer notes of berry and citrus or chocolate and nuts, dark roast or light, a good cup of coffee can be a simple pleasure. You probably would notice if some of your morning brew's brightness disappeared, or if the familiar fruity aroma dulled a little. Changes like these might not stem from when the beans were roasted or ground, but from growing conditions.

Coffee is grown on more than 27 million acres across 12.5 million largely smallholder farms in more than 50 countries. Many coffee-producing regions are increasingly experiencing changing climate conditions, whose impact on coffee's taste, aroma, and even dietary quality is as much a concern as yields and sustainability.

A new research review says that coffee quality is vulnerable to shifts in environmental factors associated with climate change. The review, led by researchers from the Friedman School of Nutrition Science and Policy at Tufts and Montana State University, also finds that some current adaptation strategies to combat these effects provide hope for positive outcomes.

"A subpar cup of coffee has economic implications as well as sensory ones. Factors that influence coffee production have great impacts on buyers' interest, the price of coffee, and ultimately the livelihoods of the farmers who grow it," says Sean Cash, an economist and the Bergstrom Foundation Professor in Global Nutrition at the Friedman School and senior author on the study, published in Frontiers in Plant Science. "Climate change

impacts on crops are already causing economic and political disruption in many parts of the world," he says. "If we can understand the science of these changes, we might help farmers and other stakeholders better manage coffee production in the face of this and future challenges."

In their analysis, the researchers looked at the effects of 10 prevalent environmental factors and management conditions associated with climate change and climate adaptation, respectively, across 73 published articles.

The most consistent trends the team found were that farms at higher altitudes were associated with better coffee flavour and aroma, while too much light exposure was associated with a decrease in coffee quality. A synthesis of the evidence found that coffee quality is also susceptible to changes due to water stress and increased temperatures and carbon dioxide, although more research on these specific factors is needed.

Some current efforts to mitigate the effects of climate change, including shade management to control light exposure, selection and maintenance of climate-resilient wild coffee plants, and pest management, show promise and feasibility, but innovative solutions to support bean growth at all elevations need to be devised, the team says.

"These strategies are giving some hope that coffee quality can be maintained or improved and will ultimately help farmers consider how to design evidence-based interventions to support their farms," says Selena Ahmed, an ethnobotanist in the Food and Health Lab at Montana State University who had been a postdoctoral scholar in the Tufts IRACDA program. "These impacts on crops are important to study in general, not just for coffee. Our food systems support our food security, nutrition and health."

Rise of frozen snacking driven by consumers' desire for permissible indulgence

By Mary Ellen Shoup 26-Oct-2021- Food Navigator USA

Consumers have evolved their definition of what qualifies as a snack and are increasingly seeking out permissibly indulgent options, which has given rise to anew type of snacking behaviour in the frozen set, Mintel consumer insights research suggests.

Mintel's consumer research findings noted that 51% of consumers surveyed are snacking because they are treating themselves more often, and 50% are snacking as a form of added comfort. Additionally, 78% of consumers believe snacking can be a part of a healthy diet and 69% want snacks that balance health and taste. This has broadened the definition of snacking particularly in the area of permissible indulgence, an area in which the frozen aisle is uniquely positioned to win, claimed Mintel senior consultant Paris Hogan in a new report.

According to Mintel, 38% of frozen novelty consumers reported that they are snacking more often than before the pandemic and in the last six months, 59% of consumers said they purchased frozen desserts as a snack. "As the definition of snacking has widened, frozen snacking has entered the consideration set in a big way," said Hogan.

Flavour and taste outweigh health attributes

"When choosing a snack to eat, 'taste,' 'flavour,' and 'satisfying a craving' out-rank 'health,' in terms of importance," said Hogan. According to Mintel consumer data, three out of four consumers look for options that are both healthy and taste great, but very few (39%) are willing to sacrifice taste for a healthier option.

This trend towards snack options that balance indulgence with health attributes has given rise to a new breed of snacking options in the frozen set, noted Hogan. "Frozen treats are no longer solely confined to the late evening/night time after dinner occasion, and in consumer's minds, have likely evolved from frozen treats to frozen snacks," she said. "Consumers are now eating frozen novelties in the early afternoon, late afternoon, and some in the late-AM, along within the evening. And, 62% of consumers snack on frozen yogurt bars and 50% on frozen ice cream bars, at least a few times a week."

This has played out in the broader market landscape with the frozen novelties market reaching $6bn in June 2021 in multi-outlet (MULO) channels growing at a rate of 13.5% in the past year vs. ice cream's 3%growth, according to Mintel. Brands such as Yasso, Outshine, and My Mochi, which have introduced a number of better-for-you products and formats to the frozen novelties category, are outpacing traditional ice cream and frozen dessert products, noted Hogan.

Meanwhile, snacking brands such as KIND have proven successful by turning up the indulgence aspect of their products. Last year, KIND entered the frozen category with its line of KIND frozen bars. "Both Yasso and Outshine outperform diet-related brands (Halo Top, Enlightened, Rebel) and traditional ice cream brands (Ben & Jerry's, Häagen-Dazs) on permissibility attributes," said Hogan, adding that the market for permissibly indulgent snacks is poised for more growth.

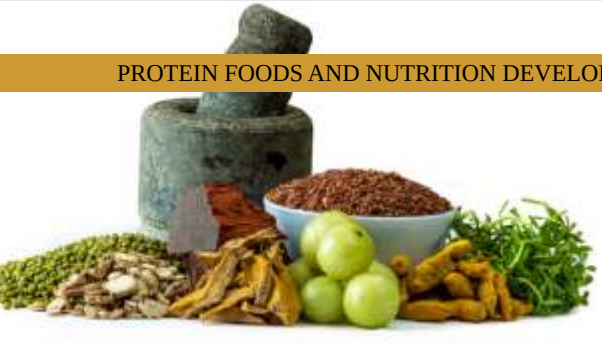
"Permissible indulgence is growing in demand, and substantial opportunities exist for frozen snacks to fill the void. And, opportunities lie ahead to extend into even more day parts, to address the needs of a wide range of consumers looking to balance health and taste, a trend that has been led by brands like Kind, Outshine, Yasso, and Sabra," said Hogan.

'Great synergy': Australia's NICM and India's AYUSH ministry to advance Ayurveda use in healthcare

By Tingmin Koe 21-Sep-2021- Food Navigator Asia

Australia's health research institute NICM has partnered with India's Ministry of AYUSH in advancing the science and use of Ayurvedic medicine in conventional healthcare.

As part of the collaboration, Western Sydney University – which NICM is a part of – had signed a MoU with India's Ministry of AYUSH earlier this month to appoint an academic chair in ayurvedic medicine.



"Recruitment and selection will soon be underway, with the successful candidate selected by a Selection Committee from The Ministry of AYUSH and Western Sydney University. The successful candidate is anticipated to start early next year – subjected to COVID-19 restrictions," NICM Health Research Institute director, Professor Dennis Chang told NutraIngredients-Asia.

Based in Australia on a three-year tenure, the academic chair's research focus will include ayurvedic herbal medicine, yoga, and meditation. The chair will also lead in the teaching, research, and policy development related to Ayurveda – such as the translation and integration of well-evidenced Ayurveda medicine into conventional healthcare. "Through the AYUSH Academic Chair program, we will work closely with our partners in India to undertake scientific research, scholar exchange and joint education and training programs in the years to come," Prof Chang said.

Scientists and researchers from both NICM and All India Institute of Ayurveda (AIIA) under AYUSH will also take part in research projects – with details to be determined in the coming months. This is not the first time the two have collaborated. Both signed its first MoU in November 2019 to promote research and training in Ayurveda medicine for managing chronic disease. Last year, both also conducted a joint webinar on the use of yoga and Ayurveda medicine for mental wellness.

Prof Chang said that the greater demand for integrating conventional medicine and evidence-based complementary medicine meant a need to conduct independent research into the benefits and limitations of Ayurveda medicine to educate consumers, medical practitioners, and governments. "There is great synergy between All India Institute of Ayurveda and NICM Health Research Institute in preclinical, clinical and translational research of traditional medicine," he said.

"The effect and power of Ayurveda and conventional medicine are tremendous, from the plants to your plate, from physical strength to mental wellbeing. Through such international research initiatives, we aim to demonstrate how," Professor Tanuja Nesari, director at AIIA, said during the MoU virtual ceremony. Aside from Ayurveda, NICM also specialises in the research of Traditional Chinese Medicine (TCM), acupuncture, and herbal medicines.

UK institute trials genome-edited wheat to reduce carcinogenic acrylamide levels in bread

03 Sep 2021 Nutrition Insight

Field trials of CRISPR-edited wheat are underway at Rothamsted Research, an unprecedented study for both the UK and mainland Europe, which have stringent GM regulation. The UK's Department for Environment Food & Rural Affairs (Defra) has green-lighted the trials to reduce high levels of acrylamide in bread – a carcinogenic processing contaminant that arises when bread containing asparagine is baked or toasted.

FoodIngredientsFirst speaks to project leader Professor Nigel Halford of Rothamsted Research, who is working to produce ultra-low asparagine, non-GM wheat using genome editing (GE) for safer and healthier bakery products. "We believe that asparagine levels can be reduced substantially in wheat without compromising grain quality. This would benefit consumers by reducing their exposure to acrylamide from their diet, and food businesses by enabling them to comply with regulations on the presence of acrylamide in their products," explains Halford. The five-year study project is unveiled as EU regulation surrounding high levels of the disconcerting contaminant tightens. Acrylamide content has been found in many foods that are fried, baked, roasted or toasted, including crisps and other snacks, chips, roast potatoes and coffee.

The problem with acrylamide Acrylamide has been found to cause cancer in rodents, although epidemiological studies linking the substance to cancer in humans have been "mixed," Halford adds. Nevertheless, acrylamide has been on the food industry's and regulatory bodies' radar since it was discovered in 2002. In addition to bakery products, acrylamide content has been found in many foods that are fried, baked, roasted or toasted, including crisps and other snacks, chips, roast potatoes and coffee.

"Current regulations on acrylamide include 'benchmark levels' for its concentration in different food types and require food businesses to monitor their products for its presence." Halford stresses that it is "likely" these regulations will be strengthened, with the EU moving towards the introduction of maximum levels. In this case, it would be illegal to sell a food product above the maximum level, he warns and other regulatory authorities would likely follow suit.

Starting in the field

With the long-term goal of making safer bread, this initial project aims to assess the performance of the wheat plants in the field and to measure the concentration of asparagine in the grain produced under field conditions. During development in the lab, researchers "knocked out" the asparagine synthetase gene, TaASN2.

Genome-edited and genetically modified crops are regulated the same way in the EU, which Halford believes is not founded on science. Asparagine concentrations in the grain of the edited plants were substantially reduced compared with un-edited plants, with one line showing a more than 90 percent reduction, according to project scientist Sarah Raffan. "This new trial will now measure the amount of asparagine in the grain of the same wheat when grown in the field, and assess other aspects of the wheat's performance, such as yield and protein content."

Under the terms of the agreement, GE wheat in the trials cannot be consumed and must be destroyed after analysis, says Halford. "Safety tests could come much later, if the wheat comes through the trials successfully, and there is a possibility that it could be commercialized."

Five years in the making

The plan is for a project of up to five years, ending in 2026, with plants being sown in September to October each year and harvested the following September. The edited plants will be grown alongside wheat in which asparagine synthesis has been affected using the "old-fashioned" method of chemically-induced mutation. Chemical mutagenesis has been widely used in plant breeding since the mid-20th century and is therefore exempt from GM regulation.

With modern genomics, the researchers can identify individuals within a mutant wheat population with mutations in the right gene. However, it is not targetable in the way that CRISPR is and results in random mutations throughout the genome, explains Halford. These have to be "stacked" by crossing different individuals so that all of the target genes are mutated, so it is a slower process than CRISPR and might have been unfeasible altogether if wheat had more copies of the target gene. The GE wheat in this round of trials will not be able to be consumed.

Editing a plant with CRISPR

CRISPR makes small changes to a target gene, in this case, to knock that gene out so that a functional protein is no longer made from it. The process initially involves genetic modification to introduce genes required for the CRISPR process into the plant. Once the edit has been made, the GM part can be removed from the plants by conventional plant breeding methods over a few generations. "We can do this by self-pollinating the plants and looking for plants in the next generation that have the edits but not the GM components. That is already in progress, and we have some lines that have already lost 2 of the 3 GM components we used," says Halford.

GM Regulation

Halford further notes that the Court of Justice of the European Union in 2018 ruled that GE crops should be regulated like GM crops. "There is no scientific basis for the current situation, or, for example, regulating GE crops more stringently than crops produced by chemical mutagenesis." "[GE crops] should not be considered the same as GM because by the end of the process, they do not contain any transgenes or foreign DNA," explains Halford.

He adds that GM plants have been heavily regulated in the EU since the 1990s, and businesses wanting to market them for food and feed use or for cultivation have to get permission (a Part C consent) from the European Commission. "That is difficult to do for food and feed use and just about impossible for cultivation. The EU does import millions of metric tons of GM soybean, maize, cotton, and so on, every year, mostly for animal feed, but no one even tries to get permission to cultivate GM crops in the EU any more."

A healthier future?

With tight EU laws, Brexit may offer some new regulatory opportunities. So far, EU law has rolled over into UK law following Brexit, says Halford. But there has been a consultation on genome editing and there is talk of the law being changed in the UK, he affirms.

By Missy Green

REGULATORY NEWS

Colour-coded nutrition labels and warnings linked to more healthful purchases

New analysis of 118 studies conducted over 30 years could help refine, improve food-labelling policies

Science Daily
October 5, 2021

A new analysis has integrated findings from 134 studies of the impact of colour-coded nutrition labels and warnings found on the front of some food packaging, indicating that these labels do indeed appear to encourage more healthful purchases. Jing Song of Queen Mary University of London, UK, and colleagues present these findings in the open-access journal PLOS Medicine.

Some countries have introduced mandatory front-of-package labelling in hope of improving people's diets and reducing the burden of diseases associated with poor diets. These labels may employ colour coding to indicate nutrition, or they may warn consumers about unhealthful features of products. However, studies on the impact of such labelling have produced mixed evidence. To help clarify the impact of front-of-package nutrition labels, Song and colleagues analyzed data from 134 peer-reviewed studies published between January 1990 and May 2021. They applied an analytical method known as network meta-analysis in order to integrate the results of the studies and evaluate the impact of four different labelling systems -- two that use colour-coding and two that use warnings.

This meta-analysis showed that all four labelling systems appeared to be advantageous in encouraging consumers to purchase more nutritionally beneficial products. Evaluation of specific nutritional qualities found that labelling nudged consumers towards foods and drinks with lower levels of energy, sodium, fat, and saturated fat. The analysis also highlighted psychological mechanisms that may underlie the different strengths of different labels, due to their impact on consumers' understanding of nutrition information and resulting changes in attitudes towards unhealthful or healthful foods. Colour-coded labels appeared to be more beneficial in promoting more healthful purchases, and warning labels were more effective in discouraging unhealthy purchases.

These findings could help guide and refine policies on front-of-package labelling to improve public health. Meanwhile, future research could build on this study by addressing related concepts, such as the impact of labelling on reformulation of products by the food industry or more long-term benefits of labelling on purchasing behaviour.

"This study found that colour-coded labels and warning labels are all able to direct consumers towards more healthful purchase behaviour," the researchers add. "Colour-coded labels can promote the purchase of more healthful products, while warning labels discourage the purchase of less healthful products.

An efficient and low-cost approach to detecting food fraud

University of Basel News & Event

The botanists tested and validated their model on a unique delta-O-18 reference dataset for strawberries.

Fraudulent practices in food production, especially false claims of geographical origin, cause billions of dollars in economic damage every year. Botanists at the University of Basel have now developed a model that can be used to determine the origin of food in an efficient and low-cost manner.

Strawberries from Switzerland or olive oil from Italy can be sold at much higher prices than the same products from other countries. Both the authorities and the food industry spend a great deal of time fighting false declarations of geographical origin that are assumed to cause an estimated USD 30 million to 40 billion a year in economic damage.

One method for detecting food fraud is to determine the $\delta^{18}O$ (delta-O-18) value of a product sample, which characterizes the oxygen isotope ratio. Until now, this procedure has been highly time consuming and costly. A case of suspected fraud involved not only collecting reference data from the claimed country of origin, but also comparative data from other regions to validate or disprove the product's origin.

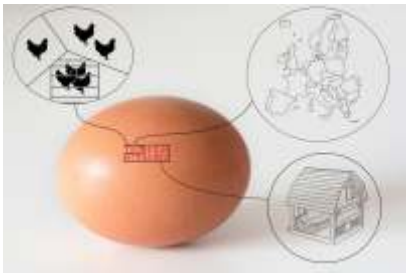
Cutting costs through model calculation

Basel botanist Dr. Florian Cueni has now developed a model in collaboration with Agroisolab GmbH, a company specializing in isotope analysis. This model is intended for use in simulating the oxygen isotope ratio in plants from individual regions, thereby eliminating the need for the time-consuming collection of reference data. The model is based on temperature, precipitation and humidity data and information about the growing season of a plant, all of which are available from publicly accessible databases.

Cueni tested and validated the $\delta^{18}O$ model on a unique reference dataset for strawberries collected across Europe over 11 years. The case study has shown that the model can simulate the origin of the strawberries with a high degree of accuracy.

Wide range of uses

"With minor adjustments to the parameters, our model can be used to determine all plant products," says Professor Ansgar Kahmen, who led the research project. This makes it possible to simplify and speed up conventiona l isotope analysis by accurately simulating the regions of origin of agricultural foodstuffs.



The model developed by the Basel botanists is of interest to food forensics officials or the investigating authorities when it comes to the origin of confiscated drugs, for example, as well as to private forensic institutes that inspect food or serve as expert witnesses in court. NGOs such as WWF or Greenpeace are also interested – especially with regard to determining the origin of illegally logged timber – as is the food industry, which suffers reputational damage due to the sale of products that may have been falsely declared.

Original publication

Florian Cueni, Daniel B. Nelson, Markus Boner, Ansgar Kahmen
Using plant physiological stable oxygen isotope models to counter food fraud.
Scientific Reports (2021), doi: 10.1038/s41598-021-96722-9

India's plant-based blow: FSSAI order to delist products with dairy terms to hit online and offline sales

By Pearly Neo 01-Oct-2021 Food Navigator Asia

The plant-based industry in India is set for a further blow after it was confirmed the Food Safety and Standards Authority India's (FSSAI) recent order for online platforms to delist all plant-based products using dairy terms will apply to products being sold offline as well.

Earlier this month, FSSAI issued an order to food firms operating via e-commerce to delist all non-dairy products, including plant-based products from their sites with immediate effect, following an earlier complaint from the National Cooperative Dairy Federation of India (NCDFI) which operates the country's largest dairy brand Amul.

According to the order, NCDFI's complaint alleged that 'non-dairy or plant-based products' had violated FSSAI regulations which prohibit the use of 'any dairy term for a product which is not milk, milk product or a composite milk product e.g. plant-based products'.

"FSSAI has [thus issued an order] dated September 1st 2021 to all e-commerce FBOs to investigate the labelling declarations of such products at their end and delist such products from their platform. Reports on this will need to be furnished to FSSAI," FSSAI Executive Director (Compliance Strategy) Inoshi Sharma, who signed the original order, told FoodNavigator-Asia.

Indian plant-based dairy firms have taken to the courts to prevent their products from being delisted over the use of dairy terms, and are warning the battle will be long despite achieving an initial legal reprieve.

Earlier this year, the plant-based industry in India was hit by an order by the Food Safety and Standards Authority India (FSSAI) to online platforms to delist all plant-based products using dairy terms , which the authority had confirmed would also apply to products being sold offline. At the time, FSSAI Executive Director (Compliance Strategy) Inoshi Sharma had told FoodNavigator-Asia that the manufacturers of all such products, barring those given exceptions such as coconut milk and peanut butter, would need to comply in changing their product names or face the relevant penalties.

"All [food firms] who are manufacturing such products which are in contravention to the above regulatory provisions are being issued notices to modify their product labels suitably to comply with the directions of FSSAI," said Sharma. "Those who fail to comply with the said directives may [find themselves in violation of the law] for offences like 'misbranding', which are compoundable offences that may [lead to an] imposition of monetary penalties as well as other actions like suspension of licenses, etc."

Following this order, five local companies – Hershey India, Drums Food International, Vegan arke Enterprises, Rakyan Beverages and Istore Direct Trading - have opted to fight back from a legal standpoint, and successfully managed to get a stay on the orders to prevent products being forcibly delisted.

All five firms manufacture plant-based dairy products such as almond milk and oat milk.

During a hearing on the matter in the Delhi High Court, Justice Rekha Palli ruled that e-commerce operators can furnish relevant reports to FSSAI, and FSSAI was free to carry out relevant investigations in accordance with the law after giving due notice to the firms concerned – but that no delisting action will be forced on the relevant firms until the court allows this. "You can ask for a report [from the e-commerce platforms] at best [but] this is not the manner. You will not take any coercive action [as] this cannot go on without anything [concrete]," said the judge.

The legal battle is far from over as a second hearing will take place later in October, and it is hard to say whether any conclusion can be reached by that time. Overall though, the situation is not expected to be resolved quite so soon, especially for plant-based dairy product manufacturers.

Plant-based industry experts in India believe that relief can only come from the creation of special standards for plant-based dairy - similar to what currently exists for coconut milk and peanut butter -but also that this will be a 'long-drawn affair, mirroring what is happening globally' , as conventional dairy is a huge engine of economic growth in the country thus any claims that plant-based products are endangering farmers are taken very seriously.

When FSSAI first proposed draft regulations to ban dairy terms last year, Good Food Institute India Managing director Varun Deshpande had told us that research has shown Indian consumers are not confused about plant-based terms, and that such a move would have impacts on plant-based producers who would need to change branding and handle consumer confusion.

Keep up: Novel food innovation outpacing regulatory frameworks and consumer communication

By Guan Yu Lim 10-Aug-2021- Food Navigator Asia

Novel food product development is rapidly outpacing regulation and consumer understanding, with experts calling for better communication and policy advances to ensure innovation leads to commercialisation.

At the Pinduoduo Food Systems Forum hosted by China's agriculture and grocery retail platform Pinduoduo, experts from the Future Ready Food Safety Hub, University of Cape Town, and Dentons Law Offices discussed the current regulatory landscape of novel foods. The panel was moderated by Xin Yi Lim, Pinduoduo's executive director of sustainability and agricultural impact.

Currently, there are no Codex standards for novel foods. Although, Singapore was the first worldwide to grant regulatory approval for cell-based chicken as a food ingredient last year. This lack of standards and harmonisation add to the complexity of market access. However, the panellists agreed that communication was key to accelerate the regulatory landscape for novel foods.

Dr Ben Smith, director at the Future Ready Food Safety Hub (FRESH), said: "A lot of this new technology is being done by the scientists in the lab. But the regulators and risk assessors, they are not scientists and need to be educated to better understand the new technology. This is often the bottleneck in regulations." Consumer attitudes around food and food safety are always changing, which may also hinder regulatory approval and market access of novel foods.

According to Smith, most of these changing attitudes are influenced by confidence and trust in the regulatory system. "(I think) here in Singapore, we have strong trust in our regulatory system, and consumers tend to be confident that the right things are being done to bring new products to market and so there's a lot of enthusiasm and interest ." He explained a key part in having this confidence and trust was communicating to consumers, ensuring that they understand the technologies used in cell-based foods. Wilfred Feng, senior counsel, at Dentons Law Offices stressed the importance of public consultations, noting this was a relatively recent development in markets such as China.

For scientists and researchers behind innovations, it is crucial they consider not only regulatory, but how consumers would perceive the product or technology, according to Smith. One classic example is Golden Rice, a genetically engineered rice, fortified with vitamin A. While it was intended to reduce vitamin A deficiency in developing countries, it has suffered from widespread misinformation around negative health impacts. Smith said it was key to start building safety and regulatory approval requirements into the innovation process, and not just on the finished product.

According to Professor Jennifer Thomson, Emeritus Professor at the University of Cape Town, this remains the case with GMO foods.

"GMO foods need science-based regulations, and good communication with farmers, public, regulators, politicians to address fears ," she said in her presentation. She added that the benefits of GMO foods far outweigh potential drawbacks, and while success is not instantaneous, government support is necessary for regulations and research, which impacts commercialisation. Feng added: "I do not think that consumers are afraid of new things, it's whether they can see the value to them," and cited how innovations such as nano technology or quantum technology tend to be perceived in a positive light, while GMO is perceived as something bad.

Clean label demand in health products maintains hold in Asia-Pacific and Europe

01 Sep 2021 Nutrition Insight

Not all products targeting health and well-being are created equal. Rising consumer awareness has prompted reformulations of naturally sourced nutritional supplements free of synthetic additives. This year, Asia-Pacific markets have observed significant traction for the clean label positioning on the back of higher living conditions, following similar successes in Europe.

NutritionInsight spotlights key players targeting the intersection of health and naturality, who have rolled out launches of probiotic cheeses, adaptogenic cannabis and mushroom bites, as well as natural fermentation-based coenzyme Q10 (CoQ10).

Defining clean label

A significant challenge is clearly defining what is meant by a "clean" supplement, Alexandre Magnin, sales and marketing manager at Kaneka Nutrients Europe (Kaneka Medical Europe), tells NutritionInsight. "As there is no exact definition of what it encompasses, it is crucial to make sure individuals involved in the process are aligned and use the right ingredients – this is especially true when working with an external formulator or contract manufacturer," he notes. "Of course, the number of partners makes it that much more difficult to communicate your clean label definition and underlying values, while guaranteeing they will be respected every step of the way."

Kaneka specializes in clean label fermentation-based ubiquinol – an electron-rich form of CoQ10. (Credit: Kaneka)Manufacturing costs are also to be taken into account as producing a clean label supplement requires a higher degree of precision. "Some traditional ingredients – used for stability, colouring, taste – cannot be used, meaning a natural alternative has to be found," Magnin highlights. "With the lack of regulation on the clean label market, a competitor could falsely advertise a supplement as 'clean' at a lower price, fooling the customer with a false claim."

Ensuring water purity throughout the whole manufacturing process is also another key area for consideration, alongside achieving ingredient stability. "Ingredient stability is a crucial yet not so easy to achieve task, especially when combining two micronutrients in the same capsule, and requires you to find the right formulating partner who shares your values, if you can't formulate in-house," says Magnin.

Key markets for clean label

The Asia-Pacific region appears to demonstrate an increasingly strong demand for clean products, which can be explained by extensive time and budgets invested in R&D in those countries, Magnin comments. "More and more consumers are also experiencing higher living conditions and have growing concerns about the ingredients used in purchased food products," he remarks. "As it is the case in other regions of the world, Asian consumers show a high propensity toward adopting a cleaner diet and, faced with a more diverse marketplace with a high production capacity, buyers can surely find what they are looking for."

European consumers, especially those from Germany and France, are also keen on clean label products due to increased health knowledge and growing number of people adopting greener lifestyles, adds Magnin.

Fermentation-based CoQ10

Among its clean label offerings, Kaneka specializes in ubiquinol – an electron-rich form of CoQ10. The Japanese company manufactures ubiquinol through an eco-friendly proprietary yeast fermentation process. "We were able to demonstrate that it is exactly the same as the substance produced in our body. Furthermore, we conducted extensive safety studies and could show it is fully safe, even in massive doses. It is indeed the major and most active form of CoQ10 present in the body. CoQ10 intake needs to be converted into ubiquinol before it can be used."

Ubiquinol is responsible for 95 percent of cellular energy production in the mitochondria (ATP). From the age of 30, the body's ability to produce ubiquinol decreases, and its levels cannot be brought back to an optimal concentration through daily diet, thus necessitating its intake in supplement form.

"Ubiquinol is also a strong endogenous antioxidant that helps soak up oxidative stress and protect cells from free radicals," Magnin continues. "Aside from acting as an energy booster and anti-aging ally, this supplement can also be indicated for heart health, among statin users, for athletes, for fertility purposes and to support the immune system."

Probiotic-enriched clean dairy

Tapping into the "food as medicine" trend, B-corp-certified clean label cultured foods brand Good Culture has launched a suite of products including lactose-free sour cream and cottage cheese line with probiotics. Good Culture's thick and creamy Lactose Free Cottage Cheese maintains the brand's high protein, "simple ingredient" promise without the lactose. The product boasts 14 g of protein per serving and is made with just five ingredients: pasture-raised milk, cream, sea salt, live and active cultures and lactase enzyme. The brand's Squeezable Lactose Free Sour Cream Pouch and Lactose Free Sour Cream Tub are lactose-free versions of the brand's cultured sour cream currently in-market today.

Meanwhile, Good Cultures Squeezable Whole Milk Classic Sour Cream Pouch is a "mess-free, spoon-free" solution making sour cream easier and more convenient. The Squeezable Whole Milk Classic Sour Cream Pouch is made with four ingredients: pasture-raised milk, cream, enzymes and live and active cultures.

"We worked hard to create unique sour cream products that deliver a thicker and more flavourful experience using only simple ingredients, gut-friendly probiotic cultures and milk that is sourced from pasture-raised cows," remarks Jesse Merrill, chief executive officer and co-founder of Good Culture. "We are also thrilled to make Good Culture accessible to lactose-sensitive folks looking for a clean and nutrient-dense experience."

Synergizing cannabis with functional mushrooms

Pantry Food Co., a functional cannabis-infused food brand created for wellness, recently introduced new clean label Superfood Bites. The Good Day Bites and Nite Bites "boldly blend nutrition and cannabis," harnessing the benefits of CBD, CBN and THC paired with functional mushrooms and adaptogens. The products are crafted by a team of chefs, nutritionists, functional medicine and cannabis experts, including Chef Michael Magliano and Dr. Debra Kimless, the chief medical officer of Pantry Food Co.

Pantry says its two new products are already on track to become its top selling products in the better-for-you cannabis category, indicating that consumers want more than just CBD or THC from their edibles. Superfood Bites by Pantry Food Co. (Credit: Pantry Food Co.)New Good Day Bites feature functional mushrooms for mood boosting and mental clarity, adaptogens to support a healthy immune system, and a 1:1 micro dose of CBD and THC (5 mg) to help consumers relieve stress and relax.

New Night Bites combine valerian root, melatonin, a 1:1 ratio of THC and CBN (5 mg), L-theanine and vegan dark chocolate to naturally ease insomnia, stress and anxiety for restful sleep. CBN, another compound found in the cannabis plant, is an effective sleep aid. Both Superfood Bites are gluten-free, low-sugar and keto friendly. They are made without artificial sweeteners, artificial flavours, palm oil, emulsifiers and sugar alcohols.

"I created Pantry to make better-for-you cannabis-infused foods that help consumers address a wide range of issues western medicine has done a poor job of solving," says Scott Jennings, co-founder and CEO of Pantry Food Co. "For centuries, humans have used adaptogenic roots, herbs and mushrooms to heal and nourish the body. We similarly embraced functional ingredients to create our Good Day Bites and Nite Bites."

By Benjamin Ferrer