PFNDAI

FOOD, NUTRITION & SAFETY MAGAZINE

BULLETIN MAR 2021

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FOOD FORTIFICATION - A TENABLE ANTIDOTE TO INDIA'S HIDDEN HUNGER

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EDITORIAL

Recently PFNDAI organised an excellent webinar on Eggs with National Egg Coordination Committee. It was very well attended and was addressed by many knowledgeable and eminent persons to tell audience about the health benefits of eggs and why people should consume eggs more often.

Dr Kumar, the Chief Operating Officer of NECC gave a nice overview of activities of NECC and how it started and progressed. He informed about the Indian egg industry being the third largest in egg production. Its turnover is more than Rs 1 lakh crore.

He told how the layer breeder egg operation was started by Dr B V Rao in early 70s and then he formed the NECC in 80s. Over the years the NECC helped farmers and the membership grew to the present over 35000 members which is the largest cooperative in the world. NECC not only helps farmers but ensures that eggs are not overpriced in the market. Their efforts have stabilised the egg price to consumers and farmers also get adequate returns.

Still egg consumption is just 75 per capita in India as against recommended 180 by NIN. So there is still a lot of work needed to create awareness about the health benefits of eggs. Eggs provide among the cheapest and highest quality protein when compared to other high quality proteins.

Several hurdles were mentioned by Dr Kumar in promotion of increased egg consumption in India. Although these eggs are unfertilised and are considered vegetarian in many countries but we still call them non-vegetarian. Also since it has high cholesterol content of over 200 mg per egg, even though it is shown by many studies that consuming one egg per day does not affect cholesterol level of blood, people are a bit hesitant in consuming eggs.

Awareness needs to be created about its value in order to try to improve the per capita consumption of eggs in India. This will be required by all stakeholders.

Indians still consume almost 95% of eggs in fresh shell eggs form. These need to be delivered from farm to the consumers through several levels like distributors, wholesalers and retailers. There is a lot of loss due to breakage, spoilage and lowering of quality. In the US and other developed countries over 70% of eggs are processed to liquid, frozen or powdered egg products. Even separate egg whites, yolks or whole egg products are available.

These products are not only very desirable in food industry but also very convenient to use at home. Especially the packs of liquid eggs would be so convenient that housewives can use whatever amount that is needed keeping the rest in fridge for later usage. There is a small increase in price but considering the convenience it would be justified.

Now branded eggs are also available not just ordinary but specialised like organic, omega-3 & other nutrient rich as well as cage-free etc. are now being explored. Thus there is plenty of scope for the industry to grow. Future is very bright for egg industry in India.

Prof Jagadish Pai,
Executive Director,
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CHANGING CONSUMER BEHAVIOUR IN FOOD INDUSTRY IN INDIA WITH SPECIAL EMPHASIS ON FROZEN FOODS

AUTHOR

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Food industry has been growing rapidly in India as urbanisation is steadily growing and farms producing fresh commodity are becoming far away from the urban centres of consumption. People are still buying many staples like fruits and vegetables from fresh market but there is a growing trend of buying packaged foods. This is more so in the frozen food sector especially during and after the current pandemic.

In food industry although there is an increase in total food market, the consumption of non-vegetarian diet is increasing more rapidly. The Census of 2014 indicates that except for a few states many have higher non-vegetarian population over the age of 15 years.

Indian frozen food market is growing steadily from about $ 310 million in 2017 to about $750 million by 2023 with an impressive CAGR of over 16%. This is tiny compared to the large global market of about $ 310 billion currently. Thus although quite small, it has great potential to grow and with many innovative means such as improvement in supply chains and also the infrastructure the increases of substantial nature are not out of place.

Benefits of Frozen foods

As the markets have become farther away from the farms, it takes longer time travelling over larger distances to reach markets. For fresh fruits and vegetables, there are losses of quality including those of nutritional qualities. Also these are picked when unripe before they reach peak of their nutrient contents because they are harder to minimise the damage during transport. So the fresh produce is not necessarily better nutritionally as many vitamins are lost during transport and storage at high temperature and exposed to light. Frozen foods are normally prepared using raw materials of very high nutritional and eating quality with quick process.

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In case of animal products the present conditions of fresh market for meat, fish and poultry is not very hygienic so safety is compromised. Frozen meats are prepared in clean and sanitised processing place using equipment and personnel which avoid contamination so the meat produced is of high microbial quality. Fresh market lacks this level of cleanliness and meat starts deteriorating rapidly due to ambient conditions of storage.

Freezing prevents growth of microbes and enzyme activity is low. All chemical and biochemical changes are minimised at very low temperature so there is no need for any preservatives and quality remains high during long shelf life.

Frozen foods not only provide safety, nutrition and health but also convenience. It removes the drudgery of cleaning and preparation of food. The ready-to-eat and ready-to-cook provide not only convenience but lack of cooking skills are compensated. This makes them extremely popular among young and busy.

During the Current Situation

Early last year, due to Covid-19 virus epidemic, suddenly many steps had to be taken which not only surprised public but also the industry and all kind of businesses.

Due to pandemic lockdown was announced and business slowed down drastically. The virus was so highly contagious all human contacts were controlled. When it was slowly relaxed with different zones, there were parks and cinema halls still under restriction.

Even after opening and relaxation, people were concerned about eating outside food. Most of frozen marine products were either sold in retail in various stores. They are also sold to hotels, restaurants and cafes (HoReCa) that prepared foods out of these for their customers. Pre-pandemic sales were very high in HoReCa but these during pandemic were badly affected. Sales in modern retails like super stores in malls etc. were also badly affected because of lockdown closed all malls. General sales however continued unabated. Even online sales soon picked up both by online players like Amazon but also the manufacturers started taking online orders. Delivery services also participated in food products delivery.

During initial period of pandemic because of uncertainty in production, supply chain and logistics, there was a lot of panic buying. As frozen foods have long shelf life they were primarily purchased by consumers. As people were afraid of buying fresh animal products, frozen meat and fish products got boost in sales. Traditional markets for chicken and fish were avoided by consumers. Consumers relied on packaged foods because of safety and sanitation.

People also considered good brands as better choices. Thus brand loyalty was very much seen because of safety concerns. Packaged foods in general also were preferred to loose or open products. All meals were now consumed at home compared to earlier 2 or 3 meals outside homes. Even now most meals are eaten home because of work-from-home culture.

Another factor came into play and that is most households and societies did not want their cooks and helps so they had to do all the food preparation themselves. They relied more on packaged food, including convenience foods, ready-to-eat and ready-to-cook food with very little time and efforts in food preparation. This also boosted sales of such category of products.

Frozen food had much better acceptance with well packaged frozen food gave better perception to consumers of hygiene and safety. Frozen also does not have any preservatives which is another point considered by consumers. Thus both quality and health aspects were positive factors in favour of frozen foods.

Ready to fry foods and snacks were very popular among children and youngsters as they could not go out and eat such foods in restaurants.

Frozen foods continued to be sold in general retail while the HoReCa sales were extremely low because people were afraid to go out to eat. Even the parties and get-togethers were factors in boosting sales of ready-to-cook and ready-to-fry products as they were very convenient to prepare and had long shelf life compared to fresh ingredients.

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Consumer Behaviour After Pandemic

Frozen food market grew substantially and even after lockdown was lifted the growth continued and sales were still high as people realised the benefits of convenience and varieties that they offered which was not easily possible for ordinary housewives without spending a lot of time and work in making them.

Challenges going forward for frozen foods are the lack of infrastructure especially in good quality frozen shelves. With opening of fresh markets, people are again slowly going for buying these from nearby markets and this will be the challenge for frozen.

One possibility could be to promote exclusive frozen stores of all sizes. These will sell all kinds of frozen foods such as chicken, fish, vegetables, ready-to-eat, ready-to-cook, frozen ingredients, and also desserts like ice creams etc.
In recent past a lot of consolidation has been happening in Indian retail space. This has resulted in lesser shelf space for frozen foods with the special mention of non-vegetarian foods.

With increased consumption of frozen foods, manufacturing and supply chain has remained a bottle neck for growth. Even though there is tremendous capacity to produce these products and the market demand is also there but the only problem is the lack of adequate store shelf space for these products. There should be enough stores to sell these products so consumers can easily go to nearby markets and buy them.

Going Forward

Frozen foods have tremendous market potential not just in domestic but globally. Currently Indian frozen food industry is just a fraction of one percent of the world market. So it can only go higher and with about 16% growth rate it can grow rapidly.

Infrastructure is the main thing that is lacking. Even with improving cold chain there is a much larger need for it not only in transport and storage but in retail. There is a urgent need for increasing retail space for frozen, especially for animal foods.

It is necessary to promote the retailers who are exclusively in frozen so there would not be just a small section in a store. We should approach Ministry of Food Processing Industry for support to this industry. There must be subsidies exclusively for frozen retail stores. This could be in the form of soft loans or exemptions from taxes or duties. This would help the frozen industry in reaching deeper into the market so these foods would be easily available to consumers at many places. There could also be distribution centres spread across to supply all these stores.

Even in a city like Mumbai, there are thousands of restaurants preparing non-vegetarian foods and serving clients but hardly a couple of hundred stores selling frozen foods. This disparity should be bridged and more stores should be available.

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INCREASING POPULARITY OF DARK CHOCOLATE

AUTHOR
Dheeraj Talreja,
President, AAK Kamani

Chocolate's popularity is unmatched and according to the World Cocoa Foundation people around the globe consume more than 3 million tons of cocoa beans each year. Chocolate is produced from the fruit of Theobroma cacao, a tropical tree whose name means "food of the gods" in Greek. Fine chocolate is classified into three categories: dark chocolate, milk chocolate, and white chocolate. Traditionally, milk chocolate has always been a long-standing favourite worldwide, but with changing times and tastes, rich dark chocolate has gained immense popularity today. The primary factor driving the growth of the dark chocolate market is its health benefits and lower added sugar content.

Several recent studies have shown that dark chocolate has many health benefits such as improving heart health, lowering risk of cancer, lowering blood pressure, ensuring superior cognitive function, cutting down cholesterol levels etc. Dark chocolate contains phytonutrients such as flavanols and polyphenols that possess antioxidant properties which help to reduce stress in individuals. With such a wide variety of health benefits, it is no wonder that the demand of dark chocolate keeps growing in the global market. Dark chocolate contains two to three times more benefits than milk chocolate because the cocoa concentration of milk chocolate is diluted with milk and possibly more sugar.

Companies in the chocolate manufacturing sector are now concentrating on spreading awareness about the different and wide ranging health benefits associated with the consumption of chocolates in order to boost their sales. This is definitely expected to drive the growth of the global cocoa fibre market in the years to come.

A strong focus on product quality has also led to more cacao beans being brought in from Latin America and African countries. Since the purchase of these premium ingredients from countries overseas increases the price of the finished product, the growing demand for gourmet chocolate by customers is paying off the dividend. Popular single origin chocolates contain cocoa originating from countries like Venezuela, Peru and Tanzania. The premium dark chocolate market is being pegged by many as a strong growth category. Leveraging the demand for diverse flavours, manufacturers are introducing a wide variety of dark chocolate flavours infused with blueberry, dried fruit, and cranberries.

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Chocolatiers also anticipate a growing demand for dark chocolate infused with natural elements such as spices, acai berry, and flower petals.

Consumer behaviours suggest the need for a wide variety of flavour profiles and efficient packaging techniques to extend the shelf life of the products. In this regard, there has been a shift in packing methods, with more advanced packing techniques that keep products fresh for longer gaining more prominence. Hence, the trends of organic and clean labelling are catching up. With competition for premium and organic products at their peak, dark chocolate makers are opting for the sustainable route. Manufacturers often focus on adding natural sweeteners such as stevia and coconut sugar to catapult their products into a consumer base that is making health-conscious choices.

Indian brands are also experimenting with chocolates to ensure consumers can get the best offering. Recently, Fabelle became the first brand in India to launch an exclusive ruby chocolate-based product. Ruby chocolate is a variety of chocolate introduced in 2017 by Barry Callebaut, a Belgian–Swiss cocoa company, and is the new variety after milk, dark and white chocolate. Manufacturers in India today are offering praline and truffle chocolates, Gianduja-style chocolates and many more international styles, thereby familiarising the Indian taste palette with the myriad flavours of premium dark chocolates. While most Indians still prefer their chocolates milky and sweet, the premium and dark chocolate revolution is slowly gathering steam.

Manufacturers today are adopting the simple approach of co-development with confectionery companies. This helps them work together and create maximum business benefits. Our company, a leader in manufacturing specialty oils and fats for confectionery, adopts a unique Co-Development approach that benefits chocolate manufacturers who can explore new and improved opportunities.

COMING EVENTS

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April 20-22, 2021
Univ of Barcelona, Barcelona, Spain
E-mail: icnfs@cbees.org
Contact: +852-3500-0137 (Hong Kong)

International Conference on Food and Nutrition
Jun 29-30, 2021
Paris, France
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IFT Annual Meeting & Food Expo 2021
July 18, 2021 18:00
McCormick Place, Chicago, USA
Contact: +1.312.782.8424
Web: https://www.iftevent.org/food-expo/exhibitors

27th International Conference on Food & Nutrition
July 26-27, 2021
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Contact: https://foodnutrition.foodtechconferences.com/registration.php

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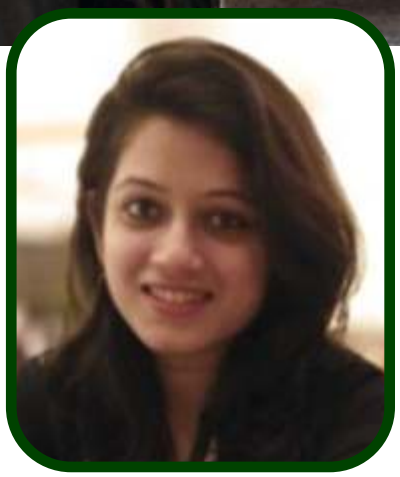
FOOD FORTIFICATION - A TENABLE ANTIDOTE TO INDIA'S HIDDEN HUNGER



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https://www.hexagonnutrition.com/

The groundwork of all happiness is health, the world however has parts of it deprived of this happiness, India being one of them. With the increase in the health risk caused by the pandemic, Nutrition feels like the only remedy that can bring full recovery and can be used with any treatment. Remember, food is our best medicine.

The situation of India -Global Hunger Index

The Global Hunger Index (GHI) is a mechanism for regulating and tracking the level of hunger at global, regional, and national levels. The values of these four-segment indicators form part of the GHI scores:

1. Undernourishment (percentage of the population with inadequate caloric intake) According to The State of Food Security and Nutrition in the World, 2020 report, 189.2 million people are undernourished in India. By this measure, 14% of the population is undernourished in India.
2. Child wasting (Acute Undernutrition: percentage of children under age five who have low weight for height) As per GHI, India's child wasting rate for 2020 stood at 17.3%.
3. Child stunting (Chronic Undernutrition: percentage of children under age five who beget low height for their age). According to a World Bank 2019 report, India has the second-highest number of stunted children at 21% as compared to other countries in the world.
4. Child mortality (inadequate nutrition and unhealthy environments: the possibility of dying between birth and exactly five years of age expressed per 1,000 live births which were 29.848 deaths per 1000 live births as of 2020 in India)

Each country's GHI score is classified by severity, from low to greatly disturbing. Starting from Zero (0) being the best score to 100 being the worst, the values of these four indicators determine hunger level at the Global Hunger Index with a score of 27.2 in 2020

PREVALENCE AND INCIDENCE OF MALNUTRITION.

People often believe malnutrition is a type of deficiency caused due to inadequate energy intake and nutrients alone. However, Malnutrition includes excesses or imbalances in a person's intake of energy and/or nutrients too i.e overweight and obesity.

Hence, types of malnutrition are divided into 3 broad groups of conditions

- Undernutrition, which covers wasting (low weight-for-height), stunting (low height-for-age) and underweight (low weight-for-age);
- Micronutrient-related malnutrition, which covers micronutrient deficiencies (a lack of important vitamins and minerals) or micronutrient excess
- Overweight, Obesity, and diet-related non-communicable diseases (such as heart disease, stroke, diabetes, and some cancers).

As mentioned earlier, with an overall score of 27.2, India has ranked 94th out of the 107 evaluated countries on the 2020 Global Hunger Index (GHI), with a level of hunger that is classified as 'serious' in the report released to recognize the World Food Day. With 17.3 percent of wasted

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children, 14 percent undernourished children under the age of 5, and 34.7 percent stunted children in the same age, and 3.7 percent of Mortality rate, as per the Global Hunger Index, one can conclude that the prevalence of malnutrition in India is 'very high'.

So, WHAT ARE THE POSSIBLE SOLUTIONS TO MALNUTRITION?

An integrated approach to deal with Malnutrition is needed on a macro level including

• NUTRITIONAL PLANNING

Nutritional planning requires the formulation of a nutrition policy and overall long-term outlining to advance composition and supplies of food, secure its fair distribution, and plans to expand the purchasing potential of people. The National Health Policy of India, which came out in 2017, envisaged that India spends at least 2.5 percent of its Gross Domestic Product (GDP) on the health sector by 2025. As a step towards meeting the targets by 2030, the Government of India launched the Prime Minister's Overarching Scheme for Holistic Nutrition (POSHAN) Abhiyan in 2017.

• IMPROVED HEALTHCARE

Improved Health care presents immunization, oral rehydration, periodic deworming, early diagnosis, and decent treatment of common illnesses & Infections like malaria, measles, and diarrhea that accelerate acute malnutrition. According to the Global Burden of Disease Study 2016 on the quality and access of healthcare, India was ranked 145th out of 180 countries. The Union government aims to build 1.5 lakh of health and wellness centers by 2022.

• EARLY DETECTION OF MALNUTRITION & INTERVENTION

A well-recorded growth chart can identify malnutrition early. If the growth of the child is delayed or is restricted as shown by the flat curve on the growth card then any hidden infection or reason for nutritional deficiency must be evaluated and taken care of. Anthropometric measures such as weight for age (WFA), height for age (HFA), weight for height (WFH), and body mass index (BMI) for age, as SD scores (ie, Z-scores) are usually used as the screening and assessment tools for early detection of malnutrition in hospitalized children.

• FOOD FORTIFICATION UNDER NUTRITION SUPPLEMENTATION.

Calories, proteins, and micronutrients like iron, vitamin A, Vitamin D, Vitamin B12, and zinc can be supplemented. Supplementation refers to the intervention where vitamins and other nutrients are used in medicine or tablet form to strengthen a normal diet. India's dietary supplement market was valued at USD 3924.44 Million in FY2020 and is predicted to grow at a CAGR of 17.28% until FY2026, to reach USD 10,198.57 Million by FY2026. Biofortification is a new intervention that involves breeding food crops, to increase their micronutrient content.

The Indian Council of Agricultural Research (ICAR) established minimum levels of iron and zinc to be bred. Recently devoted to quickly scale up production of zinc wheat seed to reach millions more vulnerable farming families, The Bihar Government established a "Nutritional Village" where 475 households will cultivate biofortified crops to defeat stunting.

Staple food fortification adds trace amounts of micronutrients to staple or commonly consumed foods or condiments during processing and thus, helps increase intake towards recommended micronutrient levels. Common examples of fortification include adding Vitamin B, Iron, and/or Zinc to wheat flour and adding Vitamin A & Vitamin D to cooking oil & Milk.

https://www.fssai.gov.in/upload/uploadfiles/files/Gazette_Notification_Food_Fortification_10_08_2018.pdf

WHY FOOD FORTIFICATION?

Micronutrients are very important and can help combat many health-related diseases, especially malnutrition. But, micronutrients cannot be produced by our body and we need to get them through our diet. If our diet is deficient, that's where food fortification comes into the picture. It is a century-old technique and the easiest way to tackle the country's nutrition crisis because it does not even require a

behavioral change at large as missing nutrients in people's diets are added to their staples. They are not asked to switch to different things.

BENEFITS OF FOOD FORTIFICATION

• Wider Reach: Staple food is widely consumed hence nutrients added to staple foods serve as an excellent vehicle to reach and improve the health of a huge portion of the population altogether.
• Safe and Secure: The entire process of adding Nutrients is regulated by various laws and added at such a minute level that the health risk that it possesses is almost minimal.

• No Change in Characteristics: It does not require any changes in food habits and patterns of people. It is a socio-culturally acceptable way to deliver nutrients to people. It does not alter the characteristics of the food: the taste, the feel, the look.
• Quick Implementation & Cost-Effective: Food Fortification facilitates smooth execution with rapid results. This method is cost-effective and leveraging and optimizing the existing technology and delivery platforms.

Even after adding the nutrients, the end cost remains the same with minimal variation, increasing the benefit-to-cost ratio.

Even though the initial investment is required to be made both in equipment and premixes, the overall cost as compared to the Return on Investment is quite low. The Copenhagen Consensus estimates that every 1 Rupee spent on fortification results in 9 Rupees in benefits to the economy. Thus it has a high benefit-to-cost ratio.

Challenges in implementing Food Fortification (struggle)

Challenges described in the following examples, such as choosing appropriate fortification vehicles, reaching target populations, avoiding overconsumption in non-target groups, and monitoring nutritional status, are relevant to all countries because they occur everywhere there is an attempt to fortify foods to optimize intakes and nutritional status.

FSSAI's CONTRIBUTION TO DEFEAT MALNUTRITION

Right from establishing Food Safety and Standards (Fortification of Foods)Regulations to notifying norms of permissible levels of micronutrients for fortifying processed food products such as breakfast cereals, biscuits, bread, rusks, pasta, noodles, buns, and fruit juices FSSAI has always focused on stakeholders participation.

https://fssai.gov.in/upload/notifications/2020/12/5fe0896c5a160Gazette_Notification_Fortification_Foods_21_12_2020.pdf

It has also released notifications on Foods for Infant Nutrition https://fssai.gov.in/upload/notifications/2020/12/5fd719575c4d5Gazette_Notification_Food_Infant_14_12_2020.pdf

It has launched the '+F' logo to be exhibited on tags of fortified Staple food products for simple identification by consumers.

FORTIFIED
SAMPOORNA POSHAN
SWASTH JEEVAN

As it encourages adding micronutrients, it also makes sure that no companies engage in an overdose, hence The Fortified Processed Food provides 15-30 percent of the Indian adult RDA (Recommended Dietary Allowance) of micronutrient, based on an average calorie intake of 600 kcal from processed foods.

HEXAGON NUTRITION AND IT'S CONTRIBUTION TO FIGHT HIDDEN HUNGER AND MALNUTRITION

Since 1991, Hexagon Nutrition has been the prime mover in delivering ingenious solutions to fight malnutrition prevalent across its community. With the coming times, it has expanded its focus to holistic nutrition across the globe with a 360-degree spectrum of wellness, and lifestyle disease management.

Apart from that it conducts webinars with the industry stakeholders & takes advantage of Social media to both leverages and gain subject expertise because it's on the mission to nourish healthy lives globally by providing quality rich products, services, and information.

At Hexagon Nutrition, we ensure quality nutrition, at Hexagon we ensure your health!! Come visit us and join us in this movement of Healthy India, today.

NUTRITION DURING COVID TIMES

(FOR PREVENTION AND THERAPY)

AUTHOR

Ms. Shilpa Joshi,
Consultant Dietitian & Diabetes Educator
Mumbai Diet & Health Centre
National Vice President,
Indian Dietetic Association

Humanity is going through one of it most challenging times. When we thought infectious disease as a problem was a passe, we are now in pandemic times. We saw a surge of COVID infection across world in year 2020, with many dying and others with a lot of complications. COVID 19 brought humanity to its knees with most nations imposing a strict lockdown for months. Despite of that number of individuals infected grew, and now we are seeing resurge of infection in many states of India.

Globally data shows that metabolic health of an individual determines the ability to fight the infection and hence the recovery. While age is a non-changeable factor (older individuals are more susceptible as compared to younger ones) metabolic health is something which can be maintained to change the trajectory of the disease. It has been seen that probability of complications is more in individuals with obesity, uncontrolled diabetes, hypertension and CVD. India is a country with high prevalence of metabolic disease and hence we all need to take care and get our metabolic parameters in control.

Also, it is the time to build up immunity. This is the most important factor that will determine our susceptibility to disease. One has to understand that immunity cannot be built in a day. The factors which improve immunity are good diet, exercise and sound sleep. All these lifestyle factors go a long way in building and maintaining immunity. We shall talk about dietary factors at length but we have to understand that other two factors are as important. Due to lockdown and many restrictions imposed on mobility, exercise as a lifestyle factor took toll. Being homebound in small apartment in bigger cities did not help the situation. Also, a very stressful environment, inability to socialise made most of people lose sleep. Both these factors added to decreased immunity.

Diet is cornerstone of good immune system. Some dietary factors like protein, micronutrients like zinc, vitamin C are seen to have an important role in immunity building and maintenance. Besides these other nutrients like carbohydrates, fats are important in maintaining metabolic health. These have an indirect impact on immunity. In short, all nutrients macro and micro are capable of impacting our immune system.

To boost your immunity, it is important that simple unprocessed diet should be consumed. There should be emphasis on unrefined grains like wheat, brown rice, millets.

Protein has a huge role in immunity building—hence including a protein rich dietary source in most of the meals consumed is important.

Proteins are found in pulses, legumes, dairy and non-vegetarian foods. Our immune cells are protein based and in fight against infection these needs to be replenished. Due to this demand for protein in diets is higher.

Fats especially invisible, unprocessed fats like those found in nuts and oilseeds are important.

Fats in these sources of foods are in their native un-oxidized form, which help in good health.

Vegetables, fruits, whole grains are also a rich source of micronutrients especially Vitamin C and B complex. These are shown to improve immunity. Hence consuming a fruit, a day and about 3-4 serving of locally grown vegetables is important.

Some vitamins and minerals are unavailable to us due to certain dietary restriction. For eg Vitamin B12, Vitamin D are primarily found in foods with animal origin.

Vegetarians need to supplement these on a regular basis. During these pandemic times certain micronutrients like zinc become very important. Diet is unable to supply the required amount and hence it is important to supplement these as well.

Certain foods with medicinal properties are called functional foods. Many such foods have shown to help boost immune system. Most frequently spoken among them are turmeric (bioactive principle curcumin). This spice is integral part of Indian cooking.

It has been shown that curcumin has antioxidant and immune boosting properties. Besides curcumin other spices like pepper, cinnamon has also shown to impact immunity of a person. It is prudent to include them in daily diets.

This pandemic among various other things has taught us that “health indeed is true wealth”. Invest in good health by consuming good food, and doing regular exercise.

COWPEAS: A NUTRITIOUS PULSE

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(Ms Vartak, Ms Soni, Ms Bhattacharjee & Ms Warrier, Msc Fd Sci & Nutr, Univ Dept of Food Sci & Nutrition, SNDT Women's Univ.
And Dr Paradkar, Dr Iyer & Dr Udipi, MRC – Kasturba Health Society)

India is the largest producer and consumer of pulses in the world. Among various pulse crops, majorly cultivated crops are chickpea, pigeon pea, mung bean, black gram, lentil and others. Cowpea (Vigna unguiculata) is an annual herbaceous edible legume from the genus Vigna and family Fabaceae. It is commonly known as Black eyed Bean or Chawli or Lobiya in India. Cowpea is less popular than Green gram, Bengal gram and Black gram; as it is considered a food that is difficult to digest (Preet and Punia, 2000).

Since cowpea consumption is not as widespread as consumption of other pulses, we conducted a survey to study cowpeas utilization in 375 families from few Indian communities. We studied different varieties of cowpeas used by five Indian communities, namely Bengali, Maharashtrian, Malayali, Gujarati and Marwari and information on traditional and non-traditional preparations made by subjects of

these communities. Except Marwari and Gujarati community, other communities were further categorized into sub communities. Bengali community was divided into Eastern Bengal community and Western Bengal community. Maharashtrian community was divided into five sub communities namely Kokanastha, Deshastha, CKP, Maratha and Vanjari. Similarly, Malayali community was divided into five sub communities namely Warrier, Marar, Nair, Menon and Ezhava. We also studied different household processing methods followed in preparing traditional preparations and possible effects of these processing methods on nutritional and anti- nutritional components of cowpeas.

Varieties of Cowpeas Used by Various Communities

Three varieties of cowpeas are commonly available in Indian market namely: Brown, Black- eyed and Brown- eyed white cowpeas. These varieties differ in colour of their seed coat, pigment of the area encircling the hilum and size. In our study we observed that the consumption of Black-eyed white cowpea was maximum in Maharashtrian community (96%), Marwari community (90%), Bengali community (85%), and Gujarati community (53%) except in Malayali community where 88% participants consumed Brown cowpeas.

As shown in Table 1, brown cowpea per 100g contains less of the essential amino acids listed in the Table as compared to white cowpea, except for Tryptophan. When compared to the requirement of these amino acids (mg/gram of protein) the white cowpea has excess of histidine and all three aromatic amino acids together (phenylalanine, tyrosine and tryptophan). The lowest content appears to be the sulfur containing amino acids, lysine and the three branched chain amino acids (Valine, Isoleucine and Leucine).

Table 1: Comparison of Amino acid content of White and Brown Cowpeas as Compared to the Requirement for different Amino acids

Amino Acids	Requirement of protein (mg/g protein)*	Actual value mg per 100 g of protein		Actual value mg per 1g of protein		% as compared to requirement (mg/g of protein)	
		White Cowpea	Brown Cowpea	White Cowpea	Brown Cowpea	White Cowpea	Brown Cowpea
Histidine	15	3250	2930	32.5	29.3	116.67%	95.33 %
Isoleucine	30	4400	4100	44	41	46.67 %	36.67 %
Leucine	59	7960	7400	79.6	74	34.92 %	25.42 %
Lysine	45	7140	6670	71.4	66.7	58.67 %	48.22 %
S-containing amino acid Cystine + Methionine	22	2130	1950	21.3	19.5	3.18 %	11.36 %
Aromatic amino acid Phenylalanine + tryptophan + tyrosine	38	9800	9350	98	93.5	157.89 %	146.05 %
Threonine	23	4100	3800	41	38	78.26 %	65.22 %
Tryptophan	6	920	1050	9.2	10.5	53.33 %	75.00 %
Valine	39	5310	4870	53.1	48.7	36.15 %	24.88 %

(Ref: Nutrient Requirement and Recommended Dietary Allowances for Indians, ICMR, 2010; Indian Food Composition Tables. (2017). Indian Council of Medical Research, 578.)

The data on number of traditional preparations of five communities and percent of families which prepare traditional recipe /recipes is presented in Table 2.

Table 2: Most Common Traditional Recipes of Communities

Community	Number of Traditional Recipes	Traditional Recipe prepared (% families)	Name of the Recipe
Maharashtrian	1	72%	Chawli Usal
Marwari	2	88%	Vadi (50%) Kadhi (38%)
Malayali	2	54%	Olan (36%) Erriserry (18%)
Bengali	1	9%	Gota Shedho
Gujarati	1	5%	Khichdi

Table 2 indicates that highest number of Maharashtrian subjects prepare one traditional preparation specific to the community. Bengali and Gujarati communities also have one traditional recipe but a small percent of subjects adhere to community specific traditional preparation. The number of traditional recipes reported by Marwari and Malyali community though is same, higher percent Marwari subjects follow traditional preparations as compared to Malayalis.

Table 3 presents community wise other traditional preparations. These traditional preparations made of cowpeas are made with cereals, and with animal foods.

Table 3: Other Traditional Preparations of Cowpeas by Subjects

Community	Name of Preparation
Marwari (15%)	DahiChawla
Marwari (10%)	Vada with or without Curds
Marwari (7.5 %)	Papad
Marwari (7.5%)	Stuffed Paratha
Marwari (2.5%)	Kadhi dal bhat
Malayali (4%)	Sweet Sundal (cowpeas, jaggery and fresh coconut)
Bengali (1.4%)	Fish Pea Curry
Gujarati (2.5%)	Chicken Chawli

Alternatively, they are served with cereal, most common being rice or wheat. It is known that pulse and cereal, or pulse with an animal food combination improves protein quality. It remains to be seen; to what extent these foods will complement each other in terms of their amino acid profiles.

Common Cooking Methods Chosen by the Communities:

As pulses are known to cause flatulence and indigestion, processing prior to cooking is important. Our study demonstrated that soaking followed by pressure cooking was the most preferred method of cooking by subjects belonging to all communities. We also noticed that germination was not followed by subjects.

Effect of Soaking and Cooking on Various Constituents of Cowpeas

Various constituents present in raw pulses affect protein and starch digestibility. They also affect mineral bioavailability. The pretreatments like soaking given to pulses followed by cooking reduces these anti nutritional factors and improves protein and starch digestibility and improve mineral bioavailability.

EFFECT OF SOAKING AND COOKING ON PROTEIN DIGESTIBILITY AND MINERAL BIOAVAILABILITY

I) Phytates: Phytic acid can reduce the digestibility of proteins by inhibiting proteases. The study of (Sinha and Kawatra, 2003) demonstrated that soaking cowpeas for 6 hours reduced phytic acid content by 8%. The loss in phytate during soaking of cowpeas may have been the function of leaching of phytate ions into soaking water. Besides, soaking activates an endogenous enzyme like phytase that leads to reduction of phytic acid. Cooking of cowpeas further reduces phytate content. (Samatiya et al 2020).

Generally phytic acids affect the bioavailability of minerals like zinc, iron, magnesium and calcium in raw seeds by forming complexes with minerals. Reduction in phytic acid improves mineral bioavailability (Samatiya et al 2020).

II) Anti-nutritional Factors (Total Polyphenols): Polyphenols are included as anti-nutrients as they play a role in the reduction of protein and starch digestibility. These compounds include phenolic acids, flavonoids and tannins distributed differently in seed coat and cotyledon of legumes. Many of the antinutrients are water soluble in nature, which enhance their removal from foods through leaching (Samatiya et al 2020).

A study by (Kalpanadevi and Mohan, 2012) reported that soaking cowpea for 12 h and pressure cooking it for 30 minutes reduces total phenolic content by 12%. Thermal and pressure conditions causes decomposition of phenolics and formation of phenolic-protein complex occurs.

III) Anti-nutritional Factors (Tannins): Tannins are water soluble polyphenols, form complexes with alkaloids, polysaccharides and proteins. Tannins accumulate mainly in the bran section of the legumes. When ingested, tannins form complexes with proteins which cause inactivation of mainly digestive enzymes and decrease protein digestibility (Samatiya et al 2020). Thus the negative effect of tannin is due to its ability to interfere with protein digestion by binding dietary protein into an indigestible form. It has been reported by (Kalpanadevi and Mohan, 2012) that when cowpeas were soaked for 12 h and pressure cooked for 30 minutes, 84% reduction in tannin content occurred due to thermal treatment and also due to the fact that these compounds in addition to their predominance in seed coats are water soluble and consequently leach into the liquid medium. On cooking, loss of tannins may also be due to heat degradation of tannin molecules or formation of water-soluble complexes.

II) Trypsin inhibitor: Trypsin inhibitor is a substance that has the ability to inhibit proteolytic activity of certain enzymes especially trypsin. (Bolade 2016) reported reduction in trypsin inhibitor and thus improvement in protein digestibility when cowpeas were soaked and cooked in preparing traditional recipes of countries of East and West Africa.

EFFECT OF SOAKING AND COOKING ON STARCH DIGESTIBILITY

III) Alpha amylase inhibitory activity:α amylase inhibitors are known as starch blockers because they contain substances that prevent dietary starches from being absorbed by the body. In a study (Choi et al, 2018) soaking cowpeas for 6 and 12 hours reduces the alpha amylase inhibitory activity by 27% and 22% respectively. The loss of enzyme inhibitors may have resulted due to leaching out effect during hydration. Further, pressure cooking cowpeas for 10-15 minutes at 1210 C reduces α amylase inhibitory activity by 77.78%. The α amylase inhibitors are thermo-sensitive and intermolecular bonds break due to high pressure and temperature.

Conclusion:

Our survey demonstrated that cowpeas, although not considered a significant pulse in India, is used by different communities in various ways. We were able to identify various community specific traditional recipes of cowpeas that are prepared although there was difference between communities in preparing traditional preparations.

Also, community specific recipes indicated use of combining other food items like vegetables or animal foods with cowpeas thus improving nutritional quality and adding variety to diet. The difference between the numbers of subjects preparing traditional recipes also suggests use of cowpeas in nontraditional or contemporary recipes by different communities.

Traditional preprocessing methods like soaking before cooking, usually pressure cooking has many beneficial effects. It reduces cooking time and improves starch and protein digestibility and mineral bioavailability by reducing anti-nutritional factors like phytic acid, tannins and total polyphenols.It needs to be seen how combination of cowpeas with cereals or with animal foods complement each other thus improving the amino acid profile or enhancing protein quality. Besides, variety specific anti-nutritional factors content in raw cowpeas and subsequent effect of traditional processing methods on these factors warrants attention.

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REPORT OF PFNDAI Webinar ON "CONNECTING RESPONSIBLY WITH CONSUMERS" - ADVERTISING & CLAIMS REGULATIONS:

BRIDGING THE GAP BETWEEN INDUSTRY & CONSUMERS,

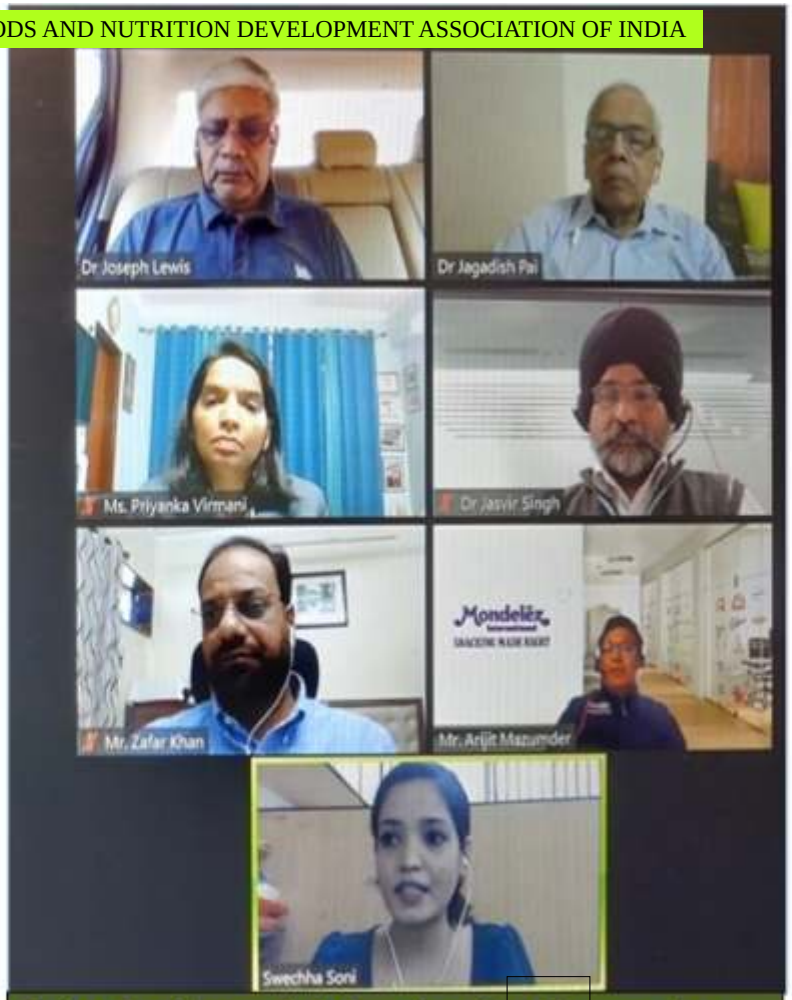
Held Virtually On 22nd Jan 2021 At 3:00 Pm On Zoom Meeting Platform

AUTHOR
Ms Anuja Padte,
Food Scientist PFNDAI

Protein Foods & Nutrition Development Association of India (PFNDAI) recently organized a webinar on Advertising & Claims regulations: Bridging the gap between Industry & Consumers which was supported by Mondelez International.

Dr J S Pai, the Executive director of PFNDAI in his welcome address welcomed all the Honorable speakers, Chair, Co-Chair, and Panelist for the 1st technical session of the Webinar series on Connecting Responsibly with Consumers.

Ms Swechha Soni, Manager Food & Nutrition, PFNDAI gave a warm welcome and invited the dignitaries of the session- Chair – Dr Joseph Lewis, Chairman Reg. Affairs Committee PFNDAI, Co-Chair – Mr Arijit Mazumder, Director RDQ AMEA, Mondelez International. Speakers: Dr Jasvir Singh - Reg, Sci and Govt Affairs Leader, DuPont; Ms Priyanka Virmani, Head, Regulatory & Sci. Affairs, South Asia Region, Nestle, Mr Zafar Khan, Head, Scientific & Regulatory Affairs, Mondelez & Panel Members - Ms Nitika Vig, Product Manager, Guardian GNC, Ms Naaznin Husein, Ex President Of IDA-Mumbai Chapter , Ms Sangeetha Srinivasan, Vice President, Strategy & Marketing, Fermenta Biotech Limited, Ms Arohi Bapna, Sr. Nutrition Scientist, R&D, Zydus Wellness Product Ltd .



Introduction of delegates for the session by Ms Swechha Soni - Manager Food & Nutrition.

Ms Virmani presented on Changes in Regulatory Environment due to New Advertising & Claims regulations where she gave her overall view on what is Claims and Advertisement & what does it mean. Claims represent in a visual, audio, and printed manner and that emphasizes the qualities of products i.e. Origin, Nutritional Properties, and composition and that advertisement also is an extension of the claims, and the representation is made by any media like TV, digital, website in a creative way. She further spoke about the regulations given by FSSAI for (Advertising and Claims) and also spoke about the Pre Era. She also briefed about various types of claims and how does consumers perceive it.

Dr Jasvir Singh presented his views on the Strategies of effective communication with consumers regarding Nutrition Claims where he spoke about the processes and philosophy for which industry needs to work to make claims in a manner which is considered to be responsible for all stakeholders.

Dr Lewis in his opening remarks mentioned that food in our context is a personal & emotional matter & therefore communication through a label or a claim is sufficient to change consumer behavior. He also mentioned the Misleading and Misguidance happening through label claims.

Mr Mazumder gave his views on the Role of Advert and Claims. He mentioned that Claim is a science of a product that shows and gives information on the product's benefits and functional aspects of the product & advertisement is the art of the claims & converting the science into art and communicating that to the consumers and these both are equally important. He also mentioned about what are the functional and emotional aspects of any products in the views of consumers.

Chair for the session - Dr J I Lewis , Chairman Reg Affairs Committee - PFNDAI

Co-Chair for the session - Mr Arijit Mazumder, Regional Dir:R&D,Mondelēz Intl

He also mentioned that there are very 2 different conflicting points i.e. is Sceptics View and Alternative view which means Claims do have the potential to contribute to the achievement of public health objectives. He mentioned that Claims can also be looked at as a form of communicating science. He further spoke about the Responsible Claims: Guidance in FSS Act, 2006 under Section 23 of the Act: Packaging and labelling of foods and also about the Responsible Claims: Guidance in A&C Regulations, 2018. He also gave an insight into the claims strategy.

Mr Zafar Khan presented on <u>Impact of Advertising & Claims on the buying choices of consumers</u> where he briefed the audience about why is advertising needed and what is the business objective behind advertising any product, while talking about the business objective he mentioned about the aspects such as Category penetration, Brand penetration, Increase usage frequency, Increase usage volume. He also briefed about the process of advertising and the study of effects on advertising. At the end of his talk, he mentioned that acreative & well-executed advertisement always has a great impact on the buying trends of the consumers; it claims to add great value and credibility.

The audience had some questions that were addressed in brief details by all the speakers after their respective talks.

The presentations by the speakers were followed by a panel discussion conducted by Dr Joseph Lewis on - Advertising & Claims regulations: Bridging the gap between Industry & Consumers.

The panelists for the session were Ms Nitika Vig, Ms Naaznin Husein, Ms Sangeetha Srinivasan, and Ms Arohi Bapna. There were a few questions taken by the panel which included the RDA mentioned on labels, Nutritional content of products, Daily diet, Health benefits, and food quality and food safety. There was also a discussion on consumer behavior towards the different health products.

A short Q & A followed after the panel discussion addressing some of the queries raised by the audience. The webinar ended with a vote of thanks to all the Honourable Speakers, Sponsors, and the delegates by Ms Girija Damle.

REPORT OF ADVERTISING & HEALTH CLAIMS OF NUTRACEUTICALS & HEALTH PRODUCTS: WHAT DO CONSUMERS UNDERSTAND BY HEALTH CLAIMS: WEBINAR REPORT

AUTHOR

Ms. Girija Damle,
Dietitian, PFNDAI

Protein Foods & Nutrition Development Association of India (PFNDAI) recently organized a webinar on "Advertising & Health Claims of Nutraceuticals & Health Products: What do consumers understand by Health claims", where the main objective was to help our audience understand what health claims are, the existing laws on nutraceuticals and health products claims in India and how manufacturers can effectively incorporate these laws during product manufacturing and labelling. The webinar was held on 29th January, 2021 from 3-5:30 pm.

The webinar was chaired and co-chaired by Mr. Dheeraj Talreja (President, AAK, India) and Mr. Phani Kumar (Head- Quality and Regulatory, Zydus Wellness) respectively. The speakers for the webinar were - Ms. Rini Sanyal (Director-Global Regulatory and Product Compliance, India Herbalife Nutrition), Dr Sudershan Rao (Ex-Deputy Director, NIN Hyderabad; Chairman, Scientific Panel on Food Additives, FSSAI) and Mr Abhinav Srivastava (Head-Regulatory Policy & Intelligence, Amway India Enterprises Pvt Ltd).

The attendees included professionals working in food industries and regulatory bodies, professors, research scholars, students, dietitians and scientists.

Dr Jagadish Pai (Executive Director at PFNDAI) welcomed everyone and gave a brief introduction of PFNDAI. Ms Swechha Soni (Manager Food & Nutrition at PFNDAI) introduced the experts of the session.

Mr Talreja in his remarks spoke about the increase in awareness about healthy eating during the pandemic and how this has positively impacted the nutraceuticals and health products industry. According to him, with the new FSSAI regulations on marketing and advertising, the manufacturers need to act more responsibly not only about marketing, but also about the health impacts of their products. He said that with this webinar the

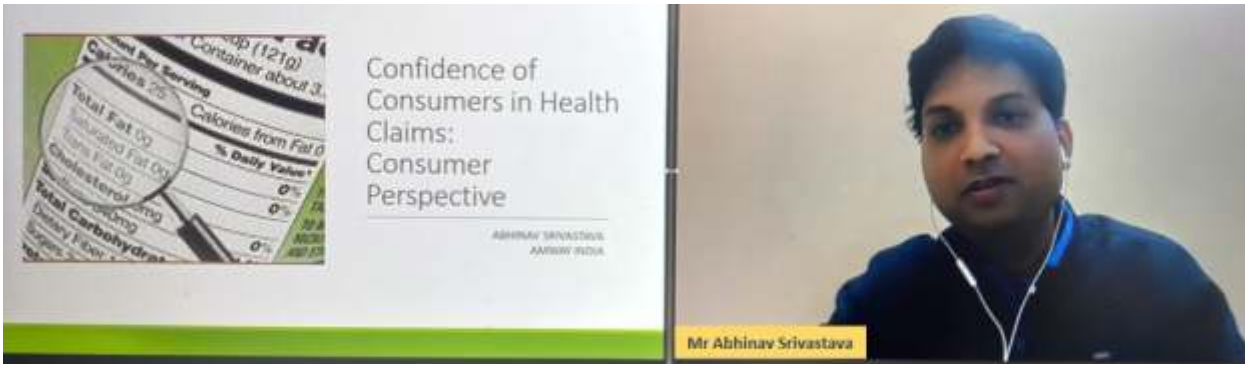
consumers as well as the industry professionals would have a clear understanding of the various nutraceutical health claims and will be able to make better health choices.

Ms Rini Sanyal in her presentation on 'Need of adding claim to a product' explained in detail, the meaning of claims and health claims and the three perspectives on why are claims necessary; namely- business perspective, consumer perspective and regulatory perspective. She gave insights on how to select a claim that justify the product as well as comply to the regulatory policies. She spoke on the legal perspective explaining the various regulatory guidelines on health claims.

The second speaker, Mr Abhinav Srivastava gave a talk on- 'Confidence of consumers in health claims- a consumer perspective'. As a part of his presentation, he talked about the impact of claims on the consumer and how he/she perceives it. He shared statistics about customer behaviours and enlightened the audience about the various aspects of health claims that may affect the consumer, providing the global and Indian overview. He explained how the health claim labelling can be made more effective and easier for the consumer.

Dr. Sudershan Rao talked on 'Substantiation of Claims for Value Addition in Food Products.' He gave detailed insights on the regulatory status of permitted heath claims and claim substantiation. He explained about the Codex process for substantiation of claims and the various types of trials that can be conducted for the same. He gave a global overview of the substantiation regulations in comparison to India.

The audience had some questions that were addressed in brief details by all the speakers after their respective talks.



The presentations by the speakers were followed by a panel discussion conducted by Mr. Phani Kumar, on the health claims of nutraceuticals and health products.

The panellists were Mr. Kiran Desai (Regulatory Advisor, ProInsight Consultancy Services), Dr. Subhadra Mandalika (Associate Prof of Nutrition College of Home Sci, Nirmala Niketan; Convenor NSI Mumbai Chapter), Ms. Sukhada Bhatte (Senior Manager-Regulatory & Nutrition, Hexagon Nutrition Pvt Ltd) and Mr. Sumeet Jaiswal (Head- Regulatory & Business Affairs South Asia, Oriflame).

The enlightening panel answered questions on 'best before' date and nutraceutical value, RDA and product content, difference between an 'ordinary' food and 'functional' food etc.

A short Q & A followed after the panel discussion addressing some of the queries raised by the audience. The webinar ended with a vote of thanks by Ms Girija Damle.

REGULATORY ROUND UP

By
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Director, VR FoodTech,
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Dear Readers

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

Final Gazette Notifications

Final notification amending the standards for maida , biscuit, bread, sweetening agents like honey and some of the spices. New standards for breakfast cereal is introduced. The final notification also amends the list of processing aids under Appendix C.

Final notification stipulating conditions for the sale of blended vegetable oil.

Advisories and Orders, Guidance Notes and Others

Presently, foods which are imported exclusively for use in products meant for 100 % export were exempted from clearance from Food Authority (Rule 7.3.b). It is now proposed to remove this exemption

Advisories and Orders, Guidance Notes and Others

Authorities have recognized test reports from Government Laboratories for the purpose of hygiene rating.

In a timely note, the Authority has requested the licensing officers not delay the renewal or modification of license on account of non-submission Form D1 and Form D2 annual returns. They have requested to treat the non-compliance separately.

A clarification with regard to the GM free certificate accompanying the import consignment has been issued.

RESEARCH IN HEALTH & NUTRITION

Researchers flag link between vitamin K status and COVID-19 mortality risk

05 Jan 2021 Nutrition Insight

A potential link between vitamin K levels and COVID-19 symptom severity and mortality has been flagged by a team of researchers from Bispebjerg Hospital, in Denmark.

Led by Professor Allan Linneberg, director of Center for Clinical Research and Prevention, the researchers investigated whether low vitamin K status could be a common characteristic of hospitalized COVID-19 patients. Moreover, they looked into whether a low vitamin K status may predict mortality in those patients. Their preliminary results have been submitted as a preprint. “We measured a well-accepted blood biomarker of vitamin K status that reflects the functional vitamin K status that is a result of the actions of all vitamin K homologues (K1 and K2s),” Linneberg tells NutritionInsight. “All vitamin Ks are believed to have similar actions, although there is still a need for more knowledge about that.” “We believe Vitamin K2 can be a powerful force for health and wellbeing and that only research, transparency and verification together, can truly engage this force,” Dominik Mattern,

vice president of marketing at Kappa Bioscience, tells NutritionInsight. "We aim to bring more value to the category, our customers, health professionals and end-consumers by investing into research, developing a better understanding of the roles played by vitamin K2, next to D3, in the body. Its benefits for bone and cardiovascular health are backed with substantial scientific evidence, yet other applications might emerge as discoveries are made."

Vitamin K spotlight

The study has been highlighted by Kappa Bioscience, manufacturer of K2 MK-7, which has been previously linked to positive health outcomes. The company recently supported a US-based University Hospitals (UH)'s research on the implications of vitamin K2 deficiency in COVID-19 pathogenesis and severity. Furthermore, a Kappa Bioscience-funded study review positioned vitamin K metabolism as the "potential missing link" between lung damage and thrombo-embolism – two of the most serious outcomes observed in COVID-19 patients. Linneberg explains that regarding public health, the findings are of potential interest if the function of vitamin K becomes broader to include a potential preventive effect against specific infection going off the rails. "It could strengthen the recommendations for intake of vitamin K in future, but we need to know more. Vitamin K has lived its life in the shadow of vitamin D attracting all the attention in recent years. That could have been a mistake," he highlights. The combination of vitamin K and D has been dubbed as a "perfect pair" by previous studies. The research was compiled by Kappa Bioscience to educate food and supplement formulators on the relationship between the two vitamins.

Building on previous vitamin K studies

Previous promising data on the matter was published by Dr. Rob Janssen, a researcher at Canisius Wilhelmina Hospital, in Nijmegen, the Netherlands. The data showed a significant correlation between serum K2 status and the severity of COVID-19, and sparked global scientific interest. In the new study, vitamin K2 status – measured as dephosphorylated-uncarboxylated matrix Gla protein (dp-ucMGP) – was analyzed in over 138 COVID-19 patients, and compared to a control group of 140 persons from the general population, matched for similar age distribution. Levels of dp-ucMGP were significantly higher among COVID-19 patients, compared to the control population. Of the 138 patients monitored, 43 died within 90 days from admission. Mortality was significantly associated with high age, hypertension, cardiovascular disease, and increased levels of dp-ucMGP, the research found.

Analyzing the data

A Kaplan-Meier graph of cumulative risk of death stratified by dp-ucMGP levels was created. "Mortality among COVID-19 patients appears to be strongly dependent on vitamin K2 status. This suggests that vitamin K plays a role in the disease mechanisms," the researchers note. "In a state of severe vitamin K deficiency, the intra-hepatic vitamin K-dependent activation of pro-thrombotic proteins is prioritized on the expense of peripheral activation of vitamin K-dependent proteins, such as the antithrombotic protein S, and calcification-inhibitory MGP," Linneberg states. "In addition, this may increase calcification and subsequent degradation of elastic fibres in lung tissue, leading to more severe lung damage in COVID-19 patients," he explains. Because of their structural differences, vitamin K1 and K2 have different outcomes in the body. Vitamin K1 is preferentially absorbed in the liver, whereas K2 is left available for extra-hepatic tissues, the researchers detail.

Prevention before vaccination

Linneberg says that in many countries it will take a long time before the vaccination target is met and even then, there will be large proportions of unvaccinated individuals in most populations. Moreover, unvaccinated individuals may contract the virus and become severely ill, he says. The virus may mutate and change immunogenicity and maybe even escape the effects of vaccinations. "The more we learn about the disease the better we will be at treating it. The knowledge gained could also be valuable for treatment of other similar diseases. We just don't know yet." He also advises to consult with a doctor, if one is taking certain types of anticoagulant medication, before taking vitamin K supplements. "This is because vitamin K interacts with some drugs. Besides that, there are few known side effects of taking vitamin K supplements at low to moderate doses. Unfortunately, the evidence about intake of vitamin K is limited for most populations and many countries don't have consensus of how much is necessary." Going forward the team will conduct more research on the health effects of vitamin K with a focus on its effects on cardiovascular disease, bone health and other metabolic effects. "We are also eager to go into more detail with COVID-19-related effects of vitamin K," Linneberg summarizes.

By Kristiana Lalou, with additional reporting by Katherine Durrell

What is a plant-based diet? BNF survey reveals differing perceptions and low take-up forecast for 2021

04 Jan 2021
Nutrition Insight

While the term "plant-based" has matured

in global industry parlance, new British Nutrition Foundation (BNF) analysis reveals that many people are still confused about what exactly it means to eat plant-based. Meanwhile, 61 percent of UK consumers say they are unlikely to follow a plant-based diet in 2021.

In the survey, 41 percent of respondents believe that a plant-based diet means following a vegan diet. Meanwhile, 20 percent equated it with following a vegetarian diet. Almost one in ten (8 percent) state they do not know what a plant-based diet is at all. "Our survey showed that many people may think of 'plant-based diets' as equivalent to vegetarian or vegan diets and consumers may have different views about what kinds of products might fit into such a diet," Sara Stanner, the BNF's science director, tells FoodIngredientsFirst. "Research shows that diets that contain a high proportion of plant-based foods have health and environmental benefits, and we need to make sure people are not put off this style of eating by thinking they have to avoid all animal foods."
The plant-based diet is depicted in the UK government's healthy eating model, the Eatwell Guide, in which only roughly two-thirds of the foods illustrated are derived from plants. Only 10 percent of the BNF survey's participants equated the plant-based diet with a "flexitarian" approach, or a diet that provides diverse protein sources.

Millennials lead the meat-free charge

The survey, undertaken by YouGov on behalf of BNF, shows that the most likely age groups to follow a plant-based diet in the New Year are 25 to 35 and 55+, with nearly a quarter (22 percent) of respondents from each age group likely or very likely to do so. Sixteen percent of 18 to 25-year-olds; 15 percent of 25 to 35-year-olds; and 12 percent of the 55+ age group indicated they already follow a plant-based diet. Meanwhile, 45 to 54 year-olds were the least likely of all age groups to follow a plant-based diet this year (66 percent). In the survey, the most commonly selected reasons for why someone would follow a plant-based-diet were: don't agree with eating meat (53 percent); think it is more environmentally sustainable (52 percent); and a plant-based diet is healthier (42 percent).

Nuts, lentils, beans and chickpeas are table staples

In the survey, people were asked which plant-based foods they eat at least once a month. The most popular options are nuts (51 percent) and lentils, beans and chickpeas (50 percent). The results also show that more people in the younger age groups favour "processed" alternatives – such as Quorn products (26 percent of 18 to 24-year-olds) and meat-free burgers and sausages (33 percent of 25 to 34-year olds) – but that fewer people in the older age groups choose these products. Over a quarter (26 percent) of all females and 17 percent of males in the survey say they regularly consume plant-based milk alternatives, with 18 to 24-year-olds the most likely to use these products (33 percent).

However, plant-based alternatives to cheese and yogurt are eaten less often (4 percent and 11 percent respectively). A quarter (25 percent) of all respondents do not regularly eat any of the plant-based foods listed in the survey, such as pulses, nuts, meat-free mince or sausages. "It's interesting but perhaps not surprising to see that younger adults appear to be choosing more plant-based products such as milk alternatives, plant-based yogurts and plant-based ready meals than those aged 35 and over, as plant-based diets seem to particularly appeal to younger people," Stanner adds.

Health concerns continue to drive up demand

From a health perspective, previous independent research has revealed that a vegan diet may indeed aid metabolism in addition to ward off heart disease and diabetes. In contrast, Stanner at the BNF maintains that the key to a healthy diet is eating a wide variety of plant foods, but not necessarily cutting out animal products altogether. When asked whether plant-based foods and drinks are healthier than those from animals, the most common response was "neither agree nor disagree" (39 percent). "Animal foods such as meat, dairy, eggs and fish are important sources of a number of minerals and vitamins, including iron, zinc, calcium and vitamin B12, and so it's important to balance the diet to make sure we're getting everything we need," she continues.

"For many of us, the key may be finding ways of including more plant-based foods without drastic changes to the diet, for example, making stews with a mix of meat and beans instead of just meat, adding extra vegetables to meals and trying out a wider variety of plant foods or plant-based recipes." But Stanner concedes that the "plant-based" labelling may not always guarantee "healthy." "When you're shopping or choosing foods and drinks on the go, it's always a good idea to check nutrition labels where possible and to go for those foods with less saturates, salt and sugar and to think about the balance of the diet overall."

Plant-based revolution is a global phenomenon

As plant-based trends reach global phenomenon status, Innova Market Insights' Top Ten Trends report sees a renewal of 2020's "Plant-Based Revolution Trend." As a natural progression, this years' "Plant-Forward" theme spotlights

expansion to different regions and categories in 2021. The Innova Consumer Survey 2020 indicated that the top four reasons for considering plant-based alternatives were health, diet variety, sustainability and taste. As the divide between plant-based meat alternatives and their counterparts continues to shrink, the push to prohibit the use of "meaty" terminology in meat-free branding has industry's largest stakeholders talking. Impossible Foods and Naturli' Foods previously spoke to FoodIngredientsFirst about the competitive hindrances of the push toward a plant-based labelling ban, while arguing for the nutritional viability of meat analogues against traditional animal produce.

By Benjamin Ferrer

Could altering mealtimes prevent development of Type 2 diabetes?

January 15, 2021
Science Daily

An innovative new study is set to examine if changing our mealtimes to earlier or later in the day could reduce the risk of developing Type 2 diabetes.

Led by Dr Denise Robertson, Professor Jonathan Johnston and post graduate researcher Shantel Lynch from the University of Surrey, the study, outlined in the journal Nutrition Bulletin, will investigate if changing the time we eat during the day could reduce risk factors such as obesity and cholesterol levels that are typically associated with the development of Type 2 diabetes. The team of researchers will also for the first time investigate, via a series of interviews with participants and their friends and family, the impact of such changes on home life, work/social commitments and whether co-habitants of those who make such modifications are influenced to alter their own meal timings/eating habits as a result.

During the unique 10-week study, 51 participants aged between 18- 65 years old who have been identified as having an increased/moderate/high risk of developing Type 2 diabetes will be split into three groups. The first, a control group, will be asked to make no changes to their eating habits; the second group will be required to restrict their eating times during the day to between 7am- 3pm; and the third group will limit their eating time to between 12-8pm.

Participants will regularly attend the Surrey Clinical Investigations Unit to monitor their blood pressure, waist and hip circumferences and provide blood and urine samples. A registered dietitian will also use specialist eye-tracking equipment to analyse participants' eye gaze direction to identify and monitor any changes to food preferences over the course of the intervention. Previous research has shown that eye gaze direction is a strong signal of attention and preference behaviours.

Researchers will examine in detail results gathered from such visits to determine if changing the time meals are consumed to earlier or later in the day could reduce risk factors associated with Type 2 diabetes. Senior scientist of the study Dr Denise Robertson, Reader in Nutritional Physiology at the University of Surrey, said: "Type 2 diabetes is a growing problem in the UK, with over three million people diagnosed and 12.3 million people at potential risk of developing the condition, which can increase the likelihood of developing serious problems with our eyes, heart and nervous system.

"Public health initiatives are often rolled out with a focus on prevention, but these have had limited success. We need to adopt different approaches in preventing this condition. A simple solution to this could be altering when we eat our meals, lessening the risk factors associated with the development of Type 2 diabetes." PGR student and registered dietitian Shantel Lynch said: "Treating Type 2 diabetes and its associated complications places a tremendous strain on the NHS. To ease such strain there needs to be more of a focus on prevention and tackling the areas, which are often lifestyle choices that lead to the development of the condition.

"The possible benefits of altering mealtimes, such as weight loss, have become increasingly topical in nutrition-related research. However, there are still many unanswered questions and we hope to contribute to this field of research while finding out whether time-restricted feeding may help to reduce the risk of developing long-term illnesses like Type 2 diabetes, and how feasible it is to follow this diet in real life."

Jonathan Johnston, Professor of Chronobiology and Integrative Physiology at the University of Surrey, said: "Changing our mealtimes limits our energy intake to a set number of hours in the day, which leads to an extension of the daily fast that generally happens overnight. This study will help us understand what time of day is optimal to eat to reduce our chances of developing Type 2 diabetes. "We will also for the first time be investigating the impact of time-restricted feeding on individuals' work, social and home life to understand the obstacles people encounter in adapting to new mealtimes, which may affect their ability to stick to the schedule."

Age, gender, and vitamins: Older males have lower B12, B6 level post-supplementation

By Tingmin Koe 05-Jan-2021 – NutraIngredients Asia

A study from New Zealand has found that age and gender can play a role in the absorption and metabolism of vitamin B12 and B6, with older males reporting a lower serum levels post-supplementation.

In particular, older males have a lower vitamin B12 level when compared to younger males and older females, indicating an age and gender-based response to vitamin B12 supplementation. However, when it comes to vitamin B6, both older males and females have reported a lower serum level post-supplementation, indicating an age-based response. The study was conducted by researchers from the University of Auckland, Riddet Institute, High-Value Nutrition National Science Challenges, AgResearch, University of Otago, and Singapore's Agency for Science, Technology, and Research (A*STAR). Findings of the study were recently published in Nutrients. While the results could imply higher B vitamin substrate for older people, especially older males, the researchers said further work was needed to find out the reasons contributing to responses towards B vitamins supplementation.

The open-label, single-arm acute parallel study involved 20 young adults between 19 to 30 years old and 20older adults between 65 to 76 years old. They were required to take in a single Centrum multivitamin tablet, as well as a breakfast meal consisting of white bread, butter, honey, apple sauce, and orange juice. Blood samples were then collected before the meal, and hourly for four hours after the meal and supplementation were taken. The purpose was to measure the maximum concentration of vitamin B12, B1, B2, B3, B5, B6, B7, and folic acid and find out any difference between subjects from the two age groups. Aside from blood serum level, the study also measured the B vitamin levels present in the subjects' urine.

Findings showed that older men had a lower maximum concentration of vitamin B12 level in their blood serum after supplementation. Before supplementation, older men already have a lower level of vitamin B12 as compared to younger men and older women. After supplementation, vitamin B12 concentrations did increase after one hour of ingestion across all subjects. However, the increase was lesser in older adults. Older adults reported a maximum concentration of 493.88 ± 176.07 ng/mL of vitamin B12, while younger adults had 601.26 ± 164.43 ng/mL. This is consistent with the researchers' hypothesis that post-meal vitamin B12 bioavailability is altered as one ages. At the same time, there was also a gender dimension to it; with the researchers highlighting the lower maximum concentration of blood serum vitamin B12 is lower in older men.

"Postprandial serum vitamin B12 concentrations differed between age groups among the males and between sexes among the older group, with lower increases in older males (age × sex interaction; $p = 0.007$) than younger males($p = 0.002$) and older females ($p = 0.019$)," the researchers said. This echoes previous findings, where age and sex-dependent variations have been previously reported, with lower vitamin B12 reported in older adults and men. However, aside from maximum concentration, the total amount of vitamin B12 in older males did not differ significantly from the younger males and older females. "This study demonstrated that older men had a transiently different vitamin B12 response, with suppressed supplement-mediated increases compared to older females and younger males and females, but this did not impact the area under curve (AUC) over the 4 h studied," the researchers said. They added that the significance of the finding for long-term vitamin B12 status in older males is unclear.

On the other hand, older adults have a lower post-meal blood serum concentration of B6-vitamers pyridoxine and pyridoxal 5'-phosphate (PLP). For instance, they had a lower AUC of postprandial plasma pyridoxine ($p = 0.02$) and pyridoxal-5'phosphate ($p = 0.03$) forms of vitamin B6. Since the urinary excretion of pyridoxine was lower in older adults, the researchers added that malabsorption, rather than greater excretion of absorbed pyridoxine, may be one possible explanation for the lower level of pyridoxine. The researchers believe that the malabsorption could be due to age-related enzymatic conversion as well. On the other hand, older adults have a greater increase in thiamine (vitamin B1), pantothenic acid (vitaminB5), and riboflavin (vitamin B2) after taking the multivitamin. While the findings may suggest that older people have higher vitamin B6 substrate requirements, further research is required to understand the need for long-term supplementation.

Coconut and COVID-19: Philippines DOST-led study reveals virgin coconut oil reduce symptoms in suspected patients

By Guan Yu Lim 27-Jan-2021 – Food Navigator Asia

A recent study led by the Philippines Department of Science and Technology (DOST) revealed that suspected COVID-19 patients administered with virgin coconut oil (VCO)had reduced symptoms and a faster recovery phase compared to the control group.

Conducted by the Food and Nutrition Institute (FNRI) at DOST, the findings were presented in a virtual briefing by DOST Secretary Fortunato dela Peña. The study recruited 57 suspected COVID-19 patients in two quarantine facilities in Laguna, Santa Rosa Community Hospital Isolation Unit and Santa Rosa Community Isolation Unit. According to the country's Department of Health, suspected COVID-19 patients are defined as the presence of symptoms including cough, cold, body ache, headache, loss of taste, fever as well as recent travel history. In the treatment group, 29 subjects were administered liquid VCO mixed with their meals for 28 days. Subjects were given 0.6mL of VCO/kg body weight for day 1 to 3, and increased to 1.2mL of VCO/kg bodyweight for day 4 to 28. The other 28 subjects were the control.

According to project leader, Dr Imelda Angeles-Agdeppa, director of DOST-FNRI, the primary outcomes of the study were diminishing signs and symptoms such as better breathing, and lesser frequency of coughing, as well as lower levels of C-Reactive Protein (CRP). Dr Angeles-Agdeppa told NutraIngredients-Asia that symptoms in the VCO group significantly reduced by day two, while the control group only saw symptoms reduced at day three. In addition, the VCO group observed no symptoms by day 18, compared to day 23 in the control group. "This result signals faster recovery in the VCO than in the control group, which is likely supported by the early improvement in the C-Reactive Protein (CRP) levels." CRP is a marker to identify inflammation in the body.

Dr Angeles-Agdeppa said VCO's anti-viral properties were its likely mechanism in reducing symptoms. Coconut oil contains lauric acid and monolaurin which can disintegrate the virus envelope, inhibit virus replication, and prevent the binding of viral proteins to the host cell membrane. "Through this study, it was hoped that VCO can be used as a supplement to improve the health condition of the individuals considered as suspect or probable cases and to also reduce the number of days of stay in the hospital or quarantine facility," Dr Angeles-Agdeppa added. Earlier in January 2021, Marco Reyes, president of the United Coconut Associations of the Philippines, urged the country to explore VCO as therapeutic for COVID-19 as well as a wide range of viruses that afflict humans. It must be noted that VCO is not a cure, but an adjunct therapy that could prevent COVID-19 from becoming severe. This study was done on suspected COVID-19 patients, and not COVID-19 patients with a higher viral load and more severe symptoms. The project team is currently working on publishing the clinical findings.

DOST-PCHRD is currently monitoring a hospital study in Manila which will recruit 74 patients. The study is expected to complete by June 2021. "The objective of the study is to determine the safety and efficacy of VCO as adjunctive therapy for COVID-19cases specifically, the safety of VCO through clinical parameters such as lipid profile, fasting blood sugar and creatinine and the efficacy of VCO though recovery from symptoms and virus clearance." Besides VCO, DOST has also funded a melatonin study in COVID-19 patients.

According to Dr Jaime Montoya, executive director of the Philippine Council on Health Research and Development (PCHRD) at DOST, this is the first study on the use of high dose melatonin in COVID-19patients with pneumonia.

"Melatonin is not a direct viricidal agent, but it may help neutralise the deleterious effects of the SARS-CoV-2 that causes COVID-19." "Melatonin may exert a beneficial role as adjuvant therapy in the regulation of the immune system, inflammation and oxidation stress, to mitigate the complications of acute lung injury/acute respiratory distress syndrome and related multi-organ complications." Elsewhere, Indonesia is also studying VCO as a potential adjuvant therapy in COVID-19 patients. Headed by Dr Ika Trisnawati of Gadjah Mada University, the randomised clinical trial will recruit 60 participants. The intervention group will be given 15mL of VCO twice a day for two weeks.


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Red Yeast Rice: Benefits, Side Effects and Dosage

It's turned up on pharmacy shelves only within the last few decades, but red yeast rice has been prized for its powerful medicinal properties for hundreds of years. As one of the top natural remedies for high cholesterol levels, red yeast rice is one of the few natural supplements that contain active ingredients virtually identical to those found in prescription medications.

Plus, the benefits of red yeast rice extend beyond correcting cholesterol levels, with emerging research showing that it may also benefit inflammation, metabolic syndrome, blood sugar levels and more. Here are the benefits, side effects and dosage recommendations for red yeast rice.

What Is Red Yeast Rice?

Red yeast rice is a type of fermented rice that is produced using a specific species of mold. It's been used in traditional Chinese medicine for centuries for its powerful health-promoting properties. Red yeast rice contains the compound monacolin K — the same active ingredient found in prescription cholesterol-lowering medications like lovastatin. For this reason, it's often used as a cost-effective alternative to pricey medications to help reduce cholesterol levels and support heart health. Research has shown other beneficial effects as well, ranging from reduced cancer cell growth to improved blood sugar and insulin levels. Today, red yeast rice is commonly sold as an over-the-counter supplement marketed to help manage cholesterol and improve overall health.

May Promote Heart Health

Heart disease is a serious condition that affects millions and is estimated to account for 31.5% of deaths around the world. High cholesterol — one of the main risk factors for heart disease — can cause arteries to narrow and stiffen, leading to an increased risk of heart attack and stroke. Red yeast rice is commonly used as a natural remedy to help lower cholesterol levels and promote heart health, often with less adverse side effects than prescription drugs used to treat high cholesterol.

One study in 25 people showed that red yeast rice lowered total cholesterol by an average of 15% and "bad" LDL cholesterol by 21% over about two months of treatment. Similarly, an eight-week study in 79 people reported that taking 600 mg of red yeast rice twice daily significantly reduced "bad" LDL cholesterol levels, compared to a control group. What's more, one review of 21 studies found that red yeast rice was effective at reducing levels of total and "bad" LDL cholesterol, as well as triglycerides and blood pressure, when combined with statin drugs.

May Help Treat Metabolic Syndrome

Metabolic syndrome is a cluster of conditions that increase your risk of chronic conditions, such as heart disease, diabetes and stroke. Some of the criteria for metabolic syndrome include high blood pressure, excess body fat, increased blood sugar and alterations in cholesterol or triglyceride levels. Several studies have found that red yeast rice may help treat some of these risk factors and could be used as a natural treatment to aid in its prevention. One of its most well-documented effects is its ability to lower cholesterol. Research shows that it can effectively reduce both total and LDL cholesterol levels. Another small, 18-week study found that a supplement containing red yeast rice was able to reduce blood sugar, insulin levels and systolic blood pressure (the top number of a reading) in people with metabolic syndrome. Plus, an eight-week study looked at the effects of red yeast rice on mice fed a high-fat diet compared to a control group. It found that red yeast rice was able to prevent increases in cholesterol levels and body weight.

Could Reduce Inflammation

Inflammation is a normal immune response designed to protect your body against acute infections and foreign invaders. However, sustained inflammation is thought to contribute to chronic conditions like diabetes, cancer and heart disease. Studies show that supplementing with red yeast rice may help reduce inflammation and promote better health in the long term. For example, a study in 50 people with metabolic syndrome showed that taking a supplement containing red yeast rice and olive extract reduced levels of oxidative stress — a key cause of chronic inflammation — by up to 20%. Similarly, one study found that giving red yeast extract to rats with kidney damage reduced levels of specific proteins involved in inflammation in the body.

May Have Anticancer Properties

Although current research is limited to animal and test-tube studies, some evidence suggests that red yeast rice may help reduce the growth and spread of cancer cells. One study found that giving mice with prostate cancer red yeast rice powder significantly decreased tumour volume compared to a control group. Similarly, a test-tube study showed that treating prostate cancer cells with red yeast rice was able to decrease cancer cell growth to a greater degree than lovastatin, a cholesterol-lowering medication with anticancer effects. However, more research is needed to evaluate the effects of red yeast rice on other types of cancer in humans. Specifically, further studies should be done to determine how the potential anticancer effects of red yeast rice may affect the general population.

Many Supplements Contain Minimal Monacolin K

Monacolin K is the active compound found in red yeast rice that is commonly extracted and used in cholesterol-lowering statins and medications. It's typically credited with the majority of the health benefits attributed to red yeast rice, especially regarding its cholesterol-lowering properties. According to the FDA, red yeast rice products that contain monacolin K should be considered a drug, subjecting them to stricter regulations than standard over-the-counter supplements. Since 1998, the FDA has taken action against several companies selling red yeast rice extract, noting that it's illegal to market these products as supplements in the US. In recent years, a number of red yeast rice supplements have popped up, many of which evade FDA regulations by containing only trace amounts of monacolin K. However, it remains unclear how effective these products really are and whether they have the same benefits on health as true red yeast rice.

May Cause Side Effects for Some People

Despite the long list of benefits associated with red yeast rice, supplementing with it may come with some adverse effects.

Gastrointestinal problems like bloating, gas and stomach pain are some of the most commonly reported side effects of red yeast rice.

In more extreme cases, it can also cause issues like muscle problems, liver toxicity and allergic reactions, similar to the side effects caused by prescription cholesterol-lowering medications. For this reason, it's important to stick to the recommended dosage and buy from a reputable retailer to ensure you're getting the best quality possible.

Because research is still limited on the long-term safety of red yeast rice, it's also not recommended for those currently taking statins or women who are pregnant or breastfeeding. If you notice any adverse symptoms after taking red yeast rice, consider decreasing your dosage or discontinuing use and consult a trusted healthcare practitioner.

Dosage Recommendations

Red yeast rice is available in capsule or tablet form and often formulated in combination with other ingredients, such as CoQ10, nattokinase or omega-3 fatty acids. These supplements are widely available in health food stores, pharmacies and though online retailers. Doses ranging from 200–4,800 mg have been studied in clinical trials, typically containing about 10 mg of total monacolin. Most major supplement brands on the market generally recommend taking between 1,200–2,400 mg daily, divided into two to three doses. However, given the risk of adverse side effects and safety concerns associated with red yeast rice extract, it's best to speak with your doctor to determine the best dosage for you.

The Bottom Line

Red yeast rice may support heart health and reduce cholesterol levels, inflammation, cancer cell growth and risk factors of metabolic syndrome. It can cause gastrointestinal issues, allergic reactions, liver toxicity and muscle problems and is not recommended for people taking statins or women who are pregnant or breastfeeding. Most supplements recommend 1,200–2,400 mg daily. However, many products on the market today contain minimal amounts of its active ingredient, potentially negating any health benefits associated with red rice extract. Working closely with your doctor and selecting a high-quality supplement from a reputable brand is the best way to take advantage of the unique benefits that this potent ingredient has to offer.

& FOOD SCIENCE INDUSTRY NEWS

School-made lunch 'better' for children Universal meals can be more healthy - experts

January 21, 2021 Science Daily

Packing a lunchbox with fruit, sandwiches, and snacks is common practice for most Australian families. But what if there was another way?

Flinders University researchers investigating the pros and cons of school-provided lunches say uniform delivery of lunchtime food at school could be a solution to better childhood nutrition and learning in Australia. Flinders Caring Futures Institute deputy director Professor Rebecca Golley says universal school-provided lunch models -- a common practice in other countries such as the UK -- would involve all children in the school being provided with the same nutritious diet, with less room for sweet, salty or fatty 'treats' in the mix. "A universal school-provided lunch model could help to ensure all children have access to food at school, reduce stigma of children not having lunch or having different types of foods to their peers, and help to ensure children are provided with healthy lunch options," Professor Golley says, after publishing the results of an Australian study. "The meal would be prepared on site and served to children in their classroom, school hall or school yard, compared with the current school food model in Australia where generally parents provide lunch to their children, either as a lunchbox packed from home or purchased from a school canteen," says nutrition and dietetics researcher Associate Professor Golley.

"While there will need to be an initial investment to set up the necessary infrastructure and getting the right policies and guidelines in place, what is emerging from some work around Australia is that this public health strategy can deliver in terms of learning, student engagement and wellbeing. "By children being provided with healthy meals at school we think it will help children to concentrate in the classroom and support their learning." The Flinders University research team has separately completed a project describing the dietary intake of 5-12-year-old children during school hours. They found that 40% of the energy kids consume at school comes from unhealthy food, with most children consuming no or very few serves of vegetables, protein-rich foods, or dairy during school hours. Commonly consumed foods included biscuits, processed meat, packaged snacks, bread and fruit.

A separate study conducted recently in NSW found that over two thirds of purchases made at school canteens are choices high in saturated fat, total sugars, and salt. "Good nutrition during children's school years supports their growth, learning and development, with primary school aged children consuming up to almost half of their daily energy intake during school hours," says fellow Flinders researcher Brittany Johnson.

"Australian families constantly face the challenge of packing lunchboxes that are nutritious, safe and quick, and that their children will eat."
School lunchbox tips and tricks:
• Keep lunchboxes and snacks basic -- go back to the less packaged foods -- grainy sandwich, vegie sticks, fruit and yoghurt, researchers say.
• Reduce unhealthy foods by cutting portion sizes in half or limiting the number of days in a week your children eat these foods.
• Head to the supermarket with clear plans and stick to them. Avoid the snack isle. If there are no unhealthy foods brought into the home this can make it easier to eat healthier alternatives from the five food groups.

The 2020 study gathered feedback from the education, health and social services, non-government, food industry, and parents, considered several approaches, such as a 'community restaurant' where meals could be prepared and service different community groups, or off-site meals service by dedicated food preparation staff with meals delivered in bulk to school grounds. Participants also considered the feasibility of a student/self-food preparation model involving students choosing and preparing their own lunch before school or in the classroom at a food creation station or mini supermarket. The top ranked option was the universal school-provided lunch model, where existing canteen facilities and infrastructure could be used to prepare meals on site, and fees for parents subsidised based on their family income. Teachers could also eat the meals, and students could have the option to be involved in the cooking. "By capturing the social value, we will be looking at the broader benefits than just nutrition and health so see the broader reaching potential impacts," Professor Golley says.

Artemisinin for COVID-19: Indian and US firms launch clinically tested supplement after ayurvedic regulatory approval

By Tingmin Koe 19-Jan-2021 – NutraIngredients Asia

Indian supplement manufacturer Windlas Biotech and California-based Mateon Therapeutics and have developed an artemisinin supplement that acts as an adjunctive for COVID-19 treatment.

Artemisinin is a main compound found in the artemisia plant extract. Registered as an ayurvedic drug, the supplement has been approved by the Food safety standards Authority of India (FSSAI) and AYUSH Ministry. The supplement, which comes in the form of capsule, contains 500mg of purified artemisinin –trademarked ARTIVeda and protected by over 15 international patents. ARTIVeda has also been used in clinical trials across three sites involving 60 patients in India. The trial project, known as ARTI-19 India, is currently expanding and aims to recruit a total of 120 patients by end of January. Final data is expected to be available six to eight weeks thereafter. Interim results based on the first 60 patients have shown no report of adverse events and that the patients who received the supplement had recovered faster than those who received standard of care alone.

"In Ayurveda, artemesia is known as Damanaka or Davana, which is an herbal medicine in use since hundreds of years for fever, inflammation and other respiratory illnesses," Dr Vuong Trieu, chairman and CEO of Mateontold NutraIngredients-Asia. The supplement will be sold under the product name PulmoHeal via online channels Amazon, Flipkart, and1mg.com within this month. The target consumers include COVID-19 patients and individuals who have been exposed to COVID-19patients and are starting to experience symptoms, Saran Saund, chief business officer and GM of the AI division at Mateon, told us. "The interesting aspect of this drug is that it is anti-viral, it treats symptoms, but it also can be taken prophylactically. "If you suspect that you have been exposed to a COVID-19 patient, you can then dose yourself with the supplement," he said.

India is also the first market where the supplement is commercially available. The product will be made available through the traditional pharmacy retail stores subsequently. According to the interim results, the benefits of ARTIVeda were more pronounced in patients with more severe symptoms, as compared to those who experienced mild symptoms. During the randomised, parallel group trial, the patients received ARTIVeda in 500mg powder capsule with standard of care, or standard of care alone. Standard of care is defined as treatment with the medicines remdesivir, ivermectin, dexamethasone, heparin, as well as paracetamol, B complex, vitamin C, and zinc. The administration of ARTIVeda is given in three cycles. Each cycle will see the patients take in a capsule containing 500mg of ARTIVeda per day for five days. They will then stop the intake for the next five days. If the symptoms persist, they will repeat the cycle for the second time.

Interim results also showed that the median time to asymptomatic World Health Organisation (WHO) scale of 1 was five days for ARTIVeda plus standard of care, as compared to 14 days for standard of care alone. "This means that half the intervention group would have recovered within five days, which is about three times faster than the group which only received standard of care," Dr Vuong Trieu explained. He added that most of the patients only needed to undergo one round of the treatment cycle, with the exception of three of them who went on to the second cycle. The ARTI-19 trial will also be extended to Africa and Latin America, as well as recruiting patients with co-morbidities. Once the trial is completed, the company will file for Emergency Use Authorization (EUA) with regulatory authorities around the world, including India, the US, and UK. According to the company, discussions regarding EUA with several of these authorities have commenced. Dr Vuong Trieu said the company was also in talks with partners from South Korea and Philippines in conducting the trial. Mateon has hypothesised that ARTIVeda was able to suppress viral replication and clinical symptoms due to the viral infection by acting as a TGF-beta inhibitor. The company has been a developer of TGF-beta therapeutics for oncology for over a decade. "This is built on our knowledge of TGF-beta and virus replication. We have been working on TGF-beta for a long time, over 10 years. "It is when COVID-19 happened that we understand that TGF-beta is important in COVID-19 and we jumped on the fact that there is this ayurvedic medicine that has TGF-beta activity and we took that into cell-based assay and into clinical trial," Dr Vuong Trieu said. Asked if the ayurvedic drug could be resistant against the mutated strains of COVID-19, he explained: "we originally developed this drug to be agnostic of mutation, because we are targeting the host protein TGF-beta. "The host protein doesn't mutate, and so whether the virus mutates or not, it made no difference, so we expected our drug to be equally effective against all the variants."

Emotion over science:

Experts argue better social marketing can overcome negative consumer palm oil sentiment

By Pearly Neo 12-Jan-2021 – Food Navigator Asia

Consumers are opting to buy 'No Palm Oil' labelled products in places where these are available due to the sense of 'emotional protection' this confers versus any real scientific knowledge, an expert panel has claimed whilst recommending better social marketing as the best tool to fight this.

This was the opinion of the six expert panellists who convened virtually for the 'Vertical Challenges for Sustainable Palm Oil's Future' panel debate, held as part of the international Palm Oil Trade Fair and Seminar 2021 organised by the Malaysian Palm Oil Council (MPOC).
The panellists were: international civil society body Solidaridad Network Asia Senior Advisor Teoh Cheng Hai, the United Kingdom Field Conservation Manager Catherine Barton, legal firm Fratini Vergano Partner and ASEAN states advisor Pablo Vergano, MPOC Science & Environment Division Director Dr. Ruslan Abdullah and Engage Minds Hub, Consumer, Food & Health Engagement Research Center Director Professor Guendalina Graffigna. The session was moderated by MPOC Deputy CEO Belvinder Sron. Professor Graffigna spoke on data her team had collected conducted on consumers in an European population, namely Italy, who purchased No Palm Oil products, revealing that the main reason for consumers making this purchase to be very much emotional and not based on scientific knowledge or facts.

"There is growing literature starting to disentangle the beliefs of consumers regarding palm oil and palm oil products – in 2019 one study found that palm-oil free products are perceived to be 'healthier' and more eco-friendly by consumers, yet the same study also found a gap of actual knowledge regarding palm oil amongst the studied consumers," she said. "Many studies across the world are pointing out this consumer gap of knowledge, their motivations and irrational processes of decision-making that are the basis of them selecting palm oil-free products. There is a great deal of fake news around today regarding palm oil production and food products, and what we wanted to find out was why are so many consumers believing in and being misled by fake news and worrying about palm oil. "In 2020, we saw some 49% of studied Italian consumers say they often or always buy palm-oil free products, and when we crossed this behaviour with several psychological variables, [we basically] found that there are very deep emotional roots behind consumer attitudes towards palm oil."

For instance, the study found a 65-point match between palm-oil free product purchasers and consumers who believed agricultural fake news in the past three months, as well as a 54-point match with those that showed higher levels of anxiety on a clinical scale, and a 53-point match with high depression levels on a clinical scale. "When we crossed people with higher clinical levels of anxiety, depression or worry, their palm-oil free purchases increased [which means that] there is a more psychological or emotional driver or choice going on here," she stressed. "So from my perspective, solving this issue is not only a matter of knowledge or scientific information to consumers, it is also a matter of things like fantasies, worries, the overall psychological sentiment of a population. Purchasing palm oil-free products is like a paranoic (sic) approach where they prefer 'free-from' products, a similar pattern as seen with lactose-free or gluten-free – people with these emotional dynamics tend to consider free-from products as healthier as these are more protective from a psychological perspective."

Professor Graffigna also highlighted that social marketing may be the right key to getting positive palm oil messaging out there, which would potentially help to change consumer emotions about the sector as a whole, which is sorely needed at the moment. "So far commercial marketing processes have been using consumer emotions to negatively represent palm oil so I think the antidote would be to use the same rhetoric to educate consumers about the positive features," she said. "Of course there is currently a gap of scientific knowledge (where a lot of efforts are bring focused currently), but we have seen how difficult it is to spread scientific knowledge after trying to do so for the COVID-19 vaccine during this pandemic – so it is not the right strategy to employ at the peak of a problem like palm oil is facing now. Passing positive emotions and facilitating consumers in the right direction would be the better strategy, such as engaging the community, social marketing, mass media, behavioural change and consumer psychology methods."
The palm oil industry has suffered multiple attacks over the past year particularly from the EU , with many of these targeting the sustainability of the palm oil production process – but MPOC's Dr Ruslan said that rising sustainability demands may be losing sight of the original criteria for sustainability (namely meeting present needs without compromising this for future generations).
"Sustainability demands are now generally catering towards those

who are powerful, strongest, noisiest or most influential – but very seldom are meeting real ideals to fulfil actual sustainability criteria," he said. "Why have there been so many concentrated efforts made on palm oil? Well this commodity has slowly risen to become the most-produced oil worldwide (72 million MT) since the 1950s when it first came into the picture at 10 place (1.3 million MT). This rise is due to factors such as productivity and health benefits." Dr Ruslan emphasized that due to this successful rise over the past decades, 'profit and envy' have become key reasons the industry has come under attack. "When converted into monetary terms, this substantial amount has become an envy to many other different types of oil producers so this could be a reason why palm oil is under so much attack. In the beginning, much focus was on the sustainability criteria to balance for people, planet and profit – but now, there is a lot more inclination towards profit if you look at the demands.

"In addition, if you look at the main palm oil producing nations such as Indonesia (56%), Malaysia (29%) and Thailand (5%), [there is no doubt that these are nowhere near] as powerful, noisy or influential as importer nations like America and Europe – this power and noise is what can influence the sustainability demands over criteria."

Another major topic of the panel discussion was the rampant usage of 'No Palm Oil' labels in European countries, including by Roundtable of Sustainable Palm Oil (RSPO) members, most likely to boost sales despite hurting palm oil's reputation. "This labelling will hamper the uptake of certified sustainable palm oil (CSPO) but still many FMCG companies have been using this labelling, even RSPO members – RSPO has a Code of Conduct which requires support of CSPO use, but these members are flouting this commitment," said Teo. "For example, for the same brand of peanut butter produced by the same company, if you go to the Malaysian supermarket and look it will not have the Palm Oil Free/No Palm Oil label and carries the CSPO logo, but in Europe it carries a Palm Oil Free label – in clear conflict of its RSPO agreement."

According to Vergano, the No Palm Oil labels are in something of a dubious position legally, as these may imply the claiming of better health properties just for not containing palm oil. "There is clearly a pattern of marketing campaigns that mislead, sometimes even fraudulently. There are also clearly instances where the No Palm Oil labels are illegal under EU law because they imply that a product is better nutritionally or are implying a health claim," he said. "There is a very prescriptive list of health claims that can be used in the EU – so if a manufacturer wants to imply or communicate to consumers that a product contains less saturated fats than a palm oil product, what should be used is a 'No/Low in Saturated Fat' label, not a Palm Oil Free label. That is what is imposed by EU Law for producers to use – you need to show what is good about your product, not denigrate and attack a competing product."

Defining fermented foods: Researchers reveal widespread mislabelling

06 Jan 2021 Nutrition Insight

Scientists have for the first time created a consensus definition of fermented foods and detailed the exact role they can play in the human diet. Central to their findings is the distinction between probiotics and fermented foods – something often integral to nutritional claims in industry.

The study offers advice for consumers, industry stakeholders and policymakers to better classify, produce and ensure fermented food products' safety. The team of 13 researchers was drawn from the fields of microbiology, food science and technology, family medicine, ecology, immunology and microbial genetics. Previous research on the health benefits of fermented foods

has mostly been epidemiological or population-based. According to the researchers, this latest study marks the beginning of a progressive rise in randomized control trials, revealing the biological mechanisms fermented foods have on gastrointestinal and general health. Manufacturers and policymakers must be charged with helping consumers better understand the real health benefits of fermented foods, say the researchers.

Global definition of fermented foods

Their findings show "fermented foods" to be a broad and varying category, defined ultimately as "foods made through desired microbial growth and enzymatic conversions of food components." Co-author Bob Hutkins, a food science technology professor, explains this definition was formulated to encapsulate as many variants as possible and to further future scientific studies. "We created this definition to cover the thousands of different types of fermented foods from all over the world, as a starting point for further investigations into how these foods and their associated microbes affect human health." While fermenting foods has likely been a practice beginning over 14,000 years ago (one that may have facilitated human development out of hunter-gatherer societies) the practice has seen a massive resurgence in the past 20 years, which the authors say have led to serious misunderstandings and urgent questions. In particular, where and how fermented foods can impact human health.

What role do probiotics really play?

A core claim often labelled on fermented foods is that they contain probiotics and provide health benefits. However, the study has found that only a select number of fermented foods actually retain the qualities required to make this claim, and consumers are frequently misled. The world "probiotics" can only be used, they say, when it can be shown that live microorganisms are active in the food at the point of consumption. Only if there is a demonstrated health benefit conferred by well-defined and characterized live microorganisms can it be scientifically justified to make the probiotic claim. Moreover, the health benefit must, at least in part, be due to the live microorganisms and must extend beyond any nutritional benefit of the food matrix. For these reasons, the terms "fermented food" and "probiotics" cannot be used interchangeably, the researchers say.

Misleading health claims

"Many people think fermented foods are good for health", says co-author Maria Marco. "That may be true, but the scientific studies required to prove it are limited and have mainly focused on certain fermented food types." Consumers should be wary, she notes, of the many labels claiming fermented goods are superfoods. "Such labels do not convey accurate information for consumers regarding nutritional or other specific properties of fermented foods," reads the study. With such a prolific public interest in fermentation, particularly amid the COVID-19 pandemic, these warnings could be particularly pertinent to consumers wishing to strengthen their immune systems.

Raising industry standards

The authors conclude that industry must take an active role in improving its own labelling and marketing standards and better understand how different manufacturing processes affect their products. Some manufacturers supplement fermented foods with microorganisms after heat treatment, usually to satisfy consumer interest in adding live microorganisms to their diet. According to the study, these products do not reflect the expected characteristics of fermented foods containing live microorganisms. Governments should take a key role in regulating standards, bringing more fermented foods to the standard that some – such as yogurt – are already held to.

Edited by Louis Gore-Langton

Industry's role in Dietary Guidelines for Americans 2020-2025

05 Jan 2021 Nutrition Insight

Industry has hit back at accusations of its over-involvement in the Dietary Guidelines for Americans, 2020-2025. The US Department of Agriculture (USDA) and Health and Human Services (HHS) released the guidelines last week following months of anticipation. NutritionInsight speaks with members of industry about the significance of these guidelines and how they were formed.

"The Dietary Guidelines for Americans form the basis for federal nutrition policy in the US. They carry tremendous influence with health professionals and consumers alike, as well as within the food industry, driving food trends and product introductions," says Dr. Mickey Rubin, executive director of the American Egg Board's Egg Nutrition Center. The guidelines will also set important standards for federal nutrition programs such as the National School Lunch Program, adds Joseph Scimeca, senior vice president of regulatory and scientific affairs at the

International Dairy Foods Association. "Billions of federal dollars are spent every year on these programs to provide Americans with food assistance and advice on the foods and beverages that help individuals develop a healthy diet," he adds. "We appreciate HHS and USDA efforts to develop these new guidelines, which we hope will make a positive impact on food security, federal feeding programs and population health," comments Philippe Caradec, vice president, public and government affairs at Danone North America.

Addressing a host of topics

These new guidelines are especially significant as they are the first set that provides guidance for healthy dietary patterns by life stage, from birth through to older adulthood, including pregnant and lactating women. The wide-reaching recommendations include four overarching messages:

• Following a healthy dietary pattern at every life stage.

• Customizing and eating nutrient-dense foods and beverages to reflect personal preferences, cultural traditions and budgetary considerations.

• Focusing on meeting food group needs with nutrient-dense foods and beverages from five food groups – vegetables, fruits, grains, dairy and fortified soy alternatives and proteins – while staying within calorie limits.

• Limiting foods and beverages higher in added sugars, saturated fat and sodium, and limiting alcoholic beverages.

Accusations of undisclosed industry involvement

The release of the 2020 Dietary Guidelines Advisory Committee's final scientific report in July had triggered concerns about "weak science" at the time. Now, The Nutrition Coalition (TNC) – a non-profit aiming to ensure that US nutrition policy is based on rigorous scientific evidence – argues that the public is largely unaware of the "vast conflicts of interest" on the Dietary Guidelines Advisory Committee. "It is obviously worrisome that Big Food and Big Pharma should have potentially influenced the thinking of experts in charge of improving the nation's diet via whole foods – not processed foods, medical drugs or devices," says Nina Teicholz, executive director of TNC. According to TNC, members of the Dietary Guidelines Advisory Committee include those with current or past affiliations with companies such as Nestlé, ConAgra and Danone.

Industry as an "informed spectator"

However, Rubin of the American Egg Board emphasizes that industry does not have a role in building the guidelines. "Members of industry can participate in the public process the same way any citizen can participate in the public process, by submitting written public comments as well as providing oral comments at certain time points throughout the process," he explains. In the opinion of Christine Cochran, executive director of the Grain Foods Foundation, industry largely acts as an informed spectator to the guidelines process.

"However, at several points during the work of the Committee and HHS and USDA staff on the project, industry – as well as any interested citizen – can weigh in on the science being considered, the process the agencies follow in drafting the guidelines, and even, early on, on the selection of the Committee members," she explains.

Advocacy for dairy

Scimeca of the International Dairy Foods Association adds that the dairy industry does have advocacy and informational roles to play throughout the Dietary Guidelines' development process. This includes advancing awareness of publicly funded research, supporting private and academic research and disseminating the final guidelines. "During each five-year cycle of the process, we engage directly with the Dietary Guidelines Advisory Committee and the USDA and HSS to make them aware of the latest science on the vital role of dairy in the healthy diets of Americans," he details. "For the 2020-2025 report, we highlighted important scientific, peer-reviewed – and in many cases, publicly funded – literature and research demonstrating favourable outcomes related to the consumption of dairy at all fat levels."

However, the new guidelines continue to discourage saturated fat. In the dairy sector, this translates to recommendations for US consumers to purchase fat-free or low-fat milk instead of 2 percent or whole milk. "That said, all of these opportunities happen during public meetings and public comment periods, so all of these opinions are part of the public record. Industry does not directly influence the Committee, HHS/USDA staff, nor the guidelines themselves."

The road ahead

Scimeca states now that the final guidelines have been developed, the International Dairy Foods Association will work to make sure the public is aware of and understands the guidelines and the health and nutrition benefits of dairy products to people of all ages. However, he recommends that future guidelines incorporate all of the new, as well as existing science, showing a neutral or positive health outcome related to consuming dairy products at various fat levels, including fuller-fat dairy products.

Meanwhile, Cochran of the Grain Foods Foundation hopes that in the future, the scope and timeline are further evaluated to allow the committee to have a more thorough and informed investigation.

By Katherine Durrell

Clearer calorie calculations: Japan updates nutrition labelling rules to reflect carbohydrate quality in processed foods

By Pearly Neo 26-Jan-2021 – Food Navigator Asia

Japan has updated its nutrition labelling rules to both reflect the quality as well as the quantity of carbohydrates present in processed foods, and also better reflect the calculation of calories being consumed per serving.

The updates were made by Japan's Ministry of Education, Culture, Sports, Science and Technology (MEXT) via amendments to the Standard Tables of Food Composition in Japan (Standard Tables), now in its eighth revision, which is used by local processed food firms for product nutrition labelling. Since April 2020, it has been compulsory under Japan's new labelling system to label processed food products. One of the main changes made by MEXT was to further breakdown or subdivide carbohydrate types in a food product's ingredients – so instead of saying a product has just a certain composition of' carbohydrates', food labels now have to specify these further into subcategories such as 'monosaccharides' (simple sugars), 'dietary fibre' and 'sugar alcohols'. "The demand of processed foods such as frozen, chilled, retort pouches, ready-to-eat and so on [is] increasing in Japan due to changes in factors such as individual eating habits," said the ministry via official documentation.

The Standard Tables are the only official data on food ingredients [and] reference material for nutritional management and guidance in Japan including the labelling of processed foods, so it is necessary to update accordingly.

"To support dietary management based on sugar and energy (calories), we have divided 'carbohydrates' into 'available carbohydrates' such as starch and mono-/disaccharides (which contribute more to calories), and other categories like dietary fibre and sugar alcohols which contribute less to calories." Starch, monosaccharides and disaccharides are simpler sugars which are highly digestible in the gut, thus tend to contribute more to calories, whereas carbs like dietary fibre and sugar alcohols are poorly digestible and hence will not produce as many calories. "It is important to show the breakdown of carbohydrate types in each food in order to correctly grasp the actual amount of sugar intake and energy (calorie) intake that consumers are consuming," said MEXT. "Along these lines, we have also made changes to the energy (calorie) calculations in the 2020 edition of the Standard Tables which will reflect the actual conditions of energy (calorie)-producing ingredients more accurately." So for example, where previous editions calculated 'carbohydrates' by just removing other components such as proteins and fats to get a final value for calorie conversion, the new method will go further to separate the energy conversion bases on either 'available carbohydrates' or 'dietary fibres/sugar alcohols' as above. This is significant as it means consumers who read nutrition labels will now have a much clearer idea of just how much of the carbohydrate content in the food products being purchased are contributing to sugar and caloric content – items they tend to want to avoid if in pursuit of healthier diets.

All food products making nutritional claims such as low-calorie, low-salt or functional claims also need to follow the Standard Tables' values and calculation methods, so it may also become a tad harder for firms to achieve values required for making these claims.

As an example, according to the Ministry of Health, Labour and Welfare Japan, a food product must not contain more than 40kcal per 100g (food) or 20kcal per 100ml (liquid) to make a low-calorie claim - All F&B products will need to meet these conditions under the new calculation criteria as well in order to maintain the low-calorie claim. MEXT has also significantly increased the number of food ingredients (or 'energy-producing components') included in the Standard Tables to be used for energy calculation across its amino acid, fatty acid and carbohydrate composition tables. "The amino acid composition table has been increased by 396 foods to 1,954 foods (from 1,558 in the seventh edition) to calculate protein content, the fatty acid composition table by 137 foods to 1,919 foods (from 1,782) to calculate fat content and the carbohydrates composition table by 223 foods to 1,075 foods (from 852) to calculate carbohydrate content more accurately," said MEXT.

"The update has also enhanced the information and explanations for these foods and will make for better estimation of each foods' nutritional content post-processing or cooking. At the end of the day, this upgrade initiative is meant to enhance the scientific accuracy of the Standard Tables, but we are not denying the conventional simple energy calculation methods if consumers choose to use those for their dietary management."

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