



PFNDAI

FOOD, NUTRITION & SAFETY MAGAZINE

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USEFULNESS OF CLINICAL TRIALS:

Many companies prefer to conduct clinical trials through contract research organisations not just because of regulatory requirements but also since consumers nowadays like to see on label what the product can do for them. The strongest proof comes from studies conducted on human. For this a proper research partner as well as proper study subjects and place along with the selection of claim statement may be useful.

Regulators permit structure/function claims for nutrient or ingredient such as “supports joint function” for which no clinical trial may be needed. However, a more specific claim like “reduces discomfort within few days” or “increases stamina by 20%” for a product may require a study, which will give an advantage to the product.

The research partner, such as a practicing doctor, an academic institution or a professional contract research organisation will affect costs, timeline as well as results, so a careful selection is essential. If the researcher understands regulatory provisions, then planning the study and choosing proper claim statements is easier. There are advantages of each of these considering their experience and expertise as well as standing in the field.

While designing the study, inclusion and exclusion criteria such as age, gender, medical conditions etc., are important in selecting subjects. Location also becomes an important consideration as different populations not just have genetic variations but also there are other factors like diet and lifestyle that may affect the overall health.

Choice of the population to study will predominantly be determined by the intended market. Earlier studies were being conducted in a place where subjects are easily and cheaply available.

However, finally when the product is marketed the regulators are going to see if the study subjects are vastly different from those whom the product is targeted especially where claims are made for the target consumers.

Whenever such studies are intended, there is a need for an ethics committee which comprises of persons with medical, scientific as well as legal experts and social scientists and even lay persons, and will review and approve the protocol of the study. This will ensure that rights, safety and well-being of study subjects are protected and to avoid and minimise the undue harm to the subjects. A well-planned clinical study not only allows the manufacturer to make desirable claims for the product, sometime additional results may indicate further development of newer products.

Such studies are very commonly done now in India where collaboration with medical doctors, and education/research institutions have been taken. Many contract research organisations have been doing the work wherein they have the expertise to design and conduct the study getting the desirable subjects for the study.

Clinical studies are not only necessary for the claims of the products but also for safety of any new ingredient or additives also. Novel foods and genetically modified foods also need safety studies.

By the way, I am very sorry to inform you that we had sad passing away of two of the persons long associated with PFNDAI. Dr UY Rege was our member and a renowned technocrat while Mr MM Chitale was the Executive Director of PFNDAI for many years after a long career in food industry. We pray to God to let their souls rest in peace.

Prof Jagadish Pai,
Editor, PFNDAI

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FOOD FOR THOUGHT OR THOUGHT FOR FOOD



By **Dr Sesikeran. B, MD**
Former Director, National
Institute of Nutrition (ICMR)
Hon. Scientific Director, PFNDIA

During the last few days several interesting events took place in the context of iron fortification in its various forms and its efficacy and safety. In spite of the unrelentless existence of iron deficiency anemia, every science-based intervention for the community has been counter balanced by fears of the unknown. Toxicity, Tolerance, lack of evidence of long-term safety etc. have been the issues that were often raised. While the efficacy of fortification has been well established across the world in several countries, less than minimal risk alone gets highlighted in an unscientific way.

In ILSI INDIA last week an excellent seminar on the way scientific risk assessment needs to be done, was presented by two former senior scientists from ICMR NIN. The entire process is available in detail in a publication released by the ILSI. (ILSI INDIA Monograph series. Risk assessment of Vitamins, Minerals and Bioactive compounds; Bhaskaracharya. K and Sudarshan. V; 2023). I suggest that every nutritionist and policy maker should understand the intricacies and fail-safe ways of measuring risks as well as methods of a risk benefit analysis. The Nutrition Foundation of India (NFI) New Delhi did detailed community studies on Double fortified (Iodine and Iron) Salt (DFS) in addition to the already published studies done a few decades ago. The results are published {Prema et al. Int J

Community Med Public health, 2023, June 10(6) and Prabhakar Kamini et al Int J Community Med Public health 2023 Nov 10(11)}. DFS use for 12 months improved Hb in children, women and men. Improvement was higher in those who were anemic and hardly any in the non-anemic. The continued use over another 12 months showed lesser increments in those who improved in the earlier 12 months. Urinary iodine values were appropriate to the amount of iodine in the salt thus confirming that there are no losses due to presence of the iron in the salt. When the salt was discontinued slowly over 6 to 18 months the Hb values came down confirming that the iron stores do get depleted over time and need constant replacement. There were no adverse effects seen in anemic as well as non-anemic. The body is well capable of regulating the uptake. They concluded that iron fortified iodized salt usage by the population in general was safe, feasible, affordable, and sustainable method to improve iron intake and Hb status. If iron fortified iodized salt is used regularly Hb levels can be maintained with no risk of excess.

Another view or rather an overview from ICMR NIN a few days back stated that. Iron consumed from DFS along with Iron fortified rice will be less than 0.78mg/Kg/day and therefore is of no risk.

Earlier expert hematologists also dispelled the myth that iron fortified rice may not be suitable for thalassemic and in hemoglobinopathies due to risk of excess iron in an already overloaded person. Iron toxicity in these people is due to

circulating free iron an outcome of intravascular lysis of transfused red cells. Oral iron in these people when it does get absorbed circulates as transferrin bound iron and not as free iron and cannot enter the cells and cause toxic effects. Hematologists do not prohibit oral iron even in Non transfusion dependent thalassemic where Hcpidin levels are low and iron absorption may also be higher. Now that the Govt of India has rolled out DFS, Iron fortified Rice and Fortified wheat flour, sustained use by the entire population will show a decrease in anemia prevalence and all its consequences. NIN in addition will plan long term follow up (Beyond the 2+ years data we already have)

Finally, a word on the levels at which adverse effects are seen and the nature of those effects. These are Gastrointestinal disturbances like nausea, vomiting etc. and these are reversible and seen at intakes greater than 70 mg / day. This is the Lowest Observed adverse effect level. Using this figure and coming down to a No Adverse Effect Level NOAEL and dividing by the uncertainty factor based on human data the Tolerable upper limit for daily and lifelong intake is 45 mg in most countries including India. The iron intakes through the fortification programs will be well below this even at the highest levels of consumption.

Iron fortification is best done through the Govt Public health programs and staples like Salt, Rice, or Wheat. Processed food fortification may not give significant benefits even if they may not cause undesirable effects since, they are not consumed regularly nor in adequate quantities. Short term clinical studies are not appropriate to consider them beneficial in the long term. On the contrary consumers may think that the iron from these processed foods will be sufficient for them with this non regular consumption and this can be considered as misinformation.



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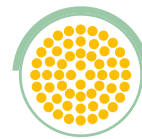
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CONSUMERS ARE PROTECTED BEFORE AN EVENT HAPPENS, NOT AFTER

AUTHOR

Dr Joseph I Lewis,
Chairman, Regulatory Affairs,
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Ahead of festival time, every year Indian sweet shops are inspected as prime suspects of selling adulterated food. Sweets found to be suspicious or contaminated are collected, confiscated, and even destroyed. Raids across the city on a tip-off, find paneer being produced under unhygienic conditions. Media reporting "raids", "tip-offs" and "rampant adulteration" are sufficient to scare people even before testing is done. Shop owners claim they follow prescribed regulations. By the time test results become available, festivals end, shops reopen, and media interest fades. Raids may be newsworthy and awaiting test results to prosecute offenders is reasonable. But knowing whether these shops have a good compliance record or not is what keeps consumers safe.

Such inspections have the potential to create a false narrative of unreliable foods entering the market. Facts, however, may reveal a different picture. An

electronic database operated by the Delhi FDA (GNCT) captures failures by product, category and type (substandard, unsafe, misbranding, violation). In the 50 months (2011-2016), 85-89% of foods were found complying with all standards. Whether other FDA/UTs have such data is unknown. Consumer protection relies on previous data. Testing at the marketplace is akin to closing the stable door after the horse has bolted.

Products entering the market are an output of a manufacturing process. They are only as good as the process is. PFA focused on finding failures in the market. When FSSA, 2006 says, that no food business operator shall manufacture, store, sell or distribute any article of food which is unsafe, it means the supply chain- farm to fork. Even though FSSA has been implemented since 2011, its execution mechanism is of the PFA. The realization that consumers are protected by a safe food supply chain - monitored by a functioning SME system - is yet to happen.

Media reporting "rampant adulteration" conveys nothing but speculation. Not every defect is of concern. Instead,

consumers would like to know if the failure would make them ill and how serious would it be. This is how risk is communicated; simple, scientific and straightforward. Regulators and scientists are unfamiliar with communicating the difference between hazard and risk, and every hazard rings alarm bells. There is always a likelihood that one may fall ill for several reasons. Food infections are often expressed as "upset tummy" or "I seem to have caught a bug". Many a schoolboy has used this ploy successfully to stay at home. Most of these ailments respond to home remedies. All that consumers need to know is how to deal with the situation. When misinformation is abundant the continued absence of risk communication- by an Authority - leaves consumers more vulnerable.

Spot inspections are redressal mechanisms responding to adverse situations in the marketplace. This is not consumer protection. Finding a failing product before it enters the market is consumer protection. Finding it after indicates inspections of the supply chain- business or regulatory - is not good enough.

VITAMIN D KI TAAKAT



MAKE THE RIGHT SHIFT FOR HEALTHIER BONE

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The human skeleton is made up of bones to provide structural support to the body. This structure protects delicate organs such as the heart and lungs among others and it provides with mobility as well. Besides, it's also a repository of bone marrow, minerals, and collagenous proteins and growth factors (1). The collagen facilitates the absorption of calcium and phosphate into the bone

matrix. Therefore, bone strength is provided by the minerals, while collagen supports for the flexibility(1-2). There are two types of tissue in the bone. The outer layer is called cortical bone (less dense) and the inner bone is called trabecular (spongy bone) (3).

The process of bone remodelling is composed of three types of cells and it's a

constant process. These cells are osteoblasts (cells that strengthening the bone), osteoclasts (cells that break down the bone minerals), and osteocytes (cells resides in the bone, which acts as a signal transducer of mechanical stimuli and modulates the function of above-mentioned bone cells). Osteoclasts are the starting point for bone remodelling, which breaks down the bone minerals. Osteoblasts then fills back the minerals into the furrows. Remodelling process is tightly regulated by multiple factors such as hormones, growth factors, nutrition, lifestyle and nutrition.





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entire bone dynamics cycle. The bone loss issues are rather complicated, because there is a cross talk amongst various organs and added pathological changes.

However, in the process of bone remodelling an imbalance is observed with age progression. The lack of balance affects bone formation and resorption, which is likely to lead to a variety of bones related diseases (1,4).

Intriguing Cross Talk of the Bone

The bones of chimpanzees have been compared to modern human. It was observed that chimp bones are densely packed with microscopic structures (i.e., the spongy bone). Human skeletons are lighter because of the relative differences in spongy bone. The sedentary nature of modern human might also play a role in this difference. Other factors, which are less discussed and contributing to the deterioration of bones, have also been identified. Few studies have shown exposure to black carbon associated with a loss of the longitudinal bones and shows that particulate matter affects bone health. It is also known that lead and other metals are sequestered in the skeleton. They are bound to calcium in hydroxyapatite and remain there throughout the life. Decrease in vitamin D absorption may be an indirect result of metals like lead, which can then trigger the

Interestingly, the least studied of these are neurological disorders and bone health. In aging especially, neurological diseases pose serious effect on bone health since the bone-brain axis is responsible for skeletal metabolism, sensory innervations and other endocrine cross talks. Thus, in short, the skeleton is not a standalone system, it has many interlinkages.

Bone Health Pathways

Bone remodelling is regulated by various factors, such as hormones, growth factors and signalling pathways. Some of the major pathways involved in the bone remodelling are, Wingless-related integration site (Wnt)/ β -catenin pathway. This pathway is activated by Wnt proteins, which bind to receptors on the surface of osteoblasts and osteocytes. This binding leads to the stabilization of β -catenin, a protein that translocate to the nucleus and activates the expression of genes that promote bone formation and inhibit bone resorption. Notch pathway, is activated by the interaction of Notch receptors and ligands on the membrane of adjacent cells. This triggers a series of proteolytic cleavages that release the Notch intracellular domain, which then translocates to the nucleus and regulates the

expression of genes that affect bone cells. Calcium signalling pathway, is activated by the influx of calcium ions into the cytoplasm of bone cells, which occurs in response to mechanical stimuli or hormonal signals. Apart from these, other pathways involved in the bone remodelling are bone morphogenic protein (BMP), receptor activator of nuclear factor kappa B ligand (RANKL), and Osteoprotegerin (OPG).

Food / Nutrients- Hindering Bone Health

There are some nutrients that can have a negative impact on bone health if consumed in excess or minor amounts. Phosphorus is a component of mineralized bone, but too much of it can interfere with calcium absorption and increase bone loss. Low levels of vitamin k also result in reduction of bone mineral density. Caffeine can also increase calcium excretion in the urine. Phytates in the diet, because of its chelating property binds to minerals and inhibits the absorption of, calcium, magnesium and zinc.



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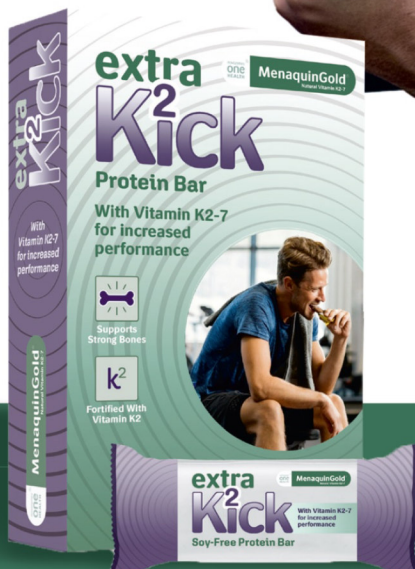
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Bone health and acidosis also go hand in hand. Acidosis have been studied extensively by various researchers. Acidosis can be caused by different factors, such as kidney disease, diabetes, diarrhea, or diet. Excessive protein diet has been implicated in causing negative homeostasis of calcium and bone loss. Possible mechanism is that the dietary protein increases the endogenous acid and causes the mobilization of calcium from bone stores, to neutralize the existing acidity. Acidosis can have negative effects on bone and its metabolism, as it can increase the loss of calcium and other minerals from the bone, leading to lower bone density, formation, and growth.

This can increase the risk of osteoporosis, which is a disease where the bones become weak and brittle(17). In our study, we mimicked the acidosis in cell culture model and studied the effect on osteoclast cells. Acidic environment showed enhancement in osteoclast activity. However, with the help of phytonutrient and a

mineral combination intervention acidosis induced osteoclast activity was inhibited.

Treatments for Osteoporosis

Some of the important antiresorptive medications in the market are bisphosphonates (alendronate, risedronate and zoledronic acid). Hormone replacement therapy also inhibit osteoclast, which in turn inhibit bone dissolution. Indian traditional knowledge also has many solutions for mobility.

Some of the potential plants or extracts known in literature (Ayurveda) include *Cissus quadrangularis*, *Terminalia arjuna* and *Piper longum* etc. These herbals act by being anti-inflammatory in nature, rich in calcium content or increase the absorption of nutrients. More studies are needed to elucidate the mechanism of herbals regulating bone health.

Bone Nutrients

The Recommended Dietary Allowances (RDA) values of bone nutrients are the daily intake that is sufficient to maintain bone health and normal calcium metabolism in healthy people. They vary depending on age, sex and physiological status.

- The Indian Council of Medical Research (ICMR) has published a note on nutrient requirements for Indians, the recommended dietary

allowances (RDA) and the estimated average requirements (EAR). Some of the essential bone nutrients and their RDA values are,

1) Calcium: The RDA for calcium is 1,000 mg/day for both men and women. The EAR for calcium is 800 mg/day for both men and women. Calcium can be found in dairy products, fortified foods, sardines, tofu, dark green vegetables, seeds, and almonds. 2) Vitamin D: The RDA for vitamin D is 10 µg/day for both men and women. The EAR for vitamin D is 7.5 µg/day for both men and women. Vitamin D can be obtained from sunlight exposure, fatty fish, fortified foods, and supplements. 3) Magnesium: The RDA for magnesium is 340 mg/day for men and 310 mg/day for women, the EAR for magnesium is 270 mg/day for men and 240 mg/day for women. Magnesium can be found in green vegetables, seeds, nuts, legumes, whole grains, and avocado (Table 1).

TABLE 1: NUTRIENT VALUES

*Nutrients	*RDA	
	Males	Females
Calcium (mg)	1000	1000
Magnesium (mg)	440	370
Vitamin D (IU)	600	600
Zinc (mg)	17	13
Vitamin C (mg)	80	65
Vitamin A (µg)	1000	840
Protein (g/d)	54 #	45.7 #

*Nutrient values comparison ICMR-NIN2020

Adult men with 65 kg Body weight & Adult women with 55 kg Body weight.



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the essential nutrients for bone health and their DRVs for adults are, 1) Calcium: 950 mg/day for both men and women. 2) Vitamin D: The adequate intake (AI) for vitamin D is

• According to the U.S. Food and Drug Administration (FDA), some of the essential nutrients for bone health are 1) Calcium: Calcium is the most abundant mineral in the body and is needed for building and maintaining strong bones. The recommended daily intake of calcium for adults is 1,000 to 1,200 mg, depending on age and gender. 2) Vitamin D: Vitamin D helps the body absorb calcium and regulates bone growth. The recommended daily intake of vitamin D for adults is 600 to 800 IU, depending on age. 3) Magnesium: The recommended daily intake of magnesium for adults is 310 to 420 mg, depending on age and gender.

• The European Food Safety Authority (EFSA) has also established dietary reference values (DRVs) for the intake of various nutrients, including those for bone health. Some of

15 μ g/day for both men and women. 3) Magnesium: 350 mg/day for men and 300 mg/day for women. Apart from the above-mentioned nutrients, other nutrients that may have a role in bone health include phosphorus, potassium, vitamin A, vitamin C, vitamin K, protein and zinc. These functions as cofactors in many reactions. A balanced diet that includes a variety of fruits, vegetables, whole grains, lean proteins, and healthy fats can provide adequate amounts of most nutrients for bone health.

To conclude, bone health plays an important role in deciding overall health and quality of life. Therefore, it is of utmost importance to attend the daily needs of bone. Proper diet and exercise could go a long way in maintaining bone health.

Hence, it is time to make the

right shift to keep our bones healthy, nourished and to keep us moving.



Further Reading

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CLEARING THE MYTHS AROUND NON CALORIC SWEETENERS EFFICACY, SAFETY, AND THEIR IMPACT ON HEALTH

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In today's health-conscious world, the debate surrounding non-caloric sweeteners has become increasingly polarized. These sugar substitutes, often referred to as artificial sweeteners, are the subject of various myths and misconceptions regarding their efficacy, safety, and their impact on various aspects of health. Let us delve deeper into the science behind these sugar alternatives and their effects on diabetes, obesity, dental health, and the gut microbiome.

Efficacy of Non-Caloric Sweeteners

Non-caloric sweeteners, such as aspartame, saccharin, sucralose, and Steviol glycosides (found in stevia), have been designed to provide the sweetness of sugar without the calories. These sugar substitutes are highly effective at their primary task: satisfying our sweet cravings without the caloric impact of sugar.

One of the primary uses of non-caloric sweeteners is to cater to individuals who are looking to reduce their sugar

consumption for health or weight management reasons. These sweeteners are highly effective in this regard. Whether you're sipping a diet soda or adding a packet of artificial sweetener to your morning coffee, you can enjoy the sweet taste without worrying about the extra calories. This makes them a powerful tool for those striving to control their weight or manage their blood sugar levels.

For individuals with diabetes, non-caloric sweeteners are a boon. Since they do not significantly affect blood glucose levels, they can be used to sweeten foods and beverages without concern for blood sugar spikes. This allows individuals with diabetes to enjoy sweet-tasting options without compromising their dietary restrictions. Furthermore, non-caloric sweeteners can help reduce

overall calorie consumption. By providing the sweet taste without the calories, they can assist in curbing sugar cravings, which, in turn, can lead to reduced consumption of energy-dense foods. While individual taste preferences may vary, many people develop a liking for the taste of these sweeteners over time.

Safety of Non-Caloric Sweeteners:

The safety of non-caloric sweeteners is a paramount concern for both regulatory authorities and consumers. Regulatory bodies like the Food and Drug Administration (FDA) in the United States and the European Food Safety Authority (EFSA) in Europe have conducted comprehensive evaluations of these sugar substitutes.



These assessments are based on rigorous examination of scientific evidence, including both short-term and long-term studies. The consensus from these authorities is clear: when consumed within established acceptable daily intake (ADI) levels, non-caloric sweeteners are considered safe for the general population. The ADI represents the maximum daily amount of a sweetener that can be consumed over a lifetime without appreciable risk to health. The ADI levels are set well below the amounts that might cause adverse effects, ensuring a wide margin of safety.

Common concerns about the safety of non-caloric sweeteners often revolve around claims of carcinogenicity or other severe health issues. However, numerous studies and reviews have found no substantial evidence linking these sweeteners to cancer, neurological problems, or other significant health problems in humans. Extensive research has failed to confirm these claims.

Impact on Diabetes: Non-caloric sweeteners can play a significant role in the management of diabetes. These sugar substitutes provide a sweet taste without significantly affecting

blood glucose levels, making them a valuable addition to the diets of individuals with diabetes.

1. Blood Sugar Control:

For

individuals with diabetes, keeping blood sugar levels within a healthy range is essential. Traditional sugar can cause rapid spikes in blood sugar levels, making it challenging for those with diabetes to enjoy sweet foods and beverages. Non-caloric sweeteners offer a way to satisfy the craving for sweetness without causing these spikes, allowing individuals with diabetes to maintain better blood sugar control.

2. Caloric Reduction:

Additionally, non-caloric sweeteners can be helpful in reducing calorie intake. Many individuals with diabetes are also looking to manage their weight. By replacing sugar with non-caloric sweeteners, they can enjoy sweet tastes without the added calories. This can be particularly advantageous for those who need to lose weight or maintain a healthy weight to manage their condition effectively.

3. Insulin Sensitivity: Some studies have suggested that non-caloric sweeteners may affect insulin sensitivity, which is a crucial factor in diabetes management. However, these

effects are generally small and may vary among individuals. It's important to note that more research is needed to fully understand the relationship between non-caloric sweeteners and insulin sensitivity.



Impact on Obesity:

Non-caloric sweeteners, when used as part of a balanced diet and overall lifestyle, can be valuable tools in the management of obesity. They can assist in weight management through several mechanisms:

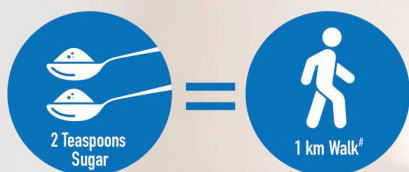
- **Calorie Reduction:** One of the primary roles of non-caloric sweeteners is to provide sweetness without the accompanying calories. This can lead to a reduction in overall calorie intake. By replacing sugar with non-caloric sweeteners, individuals can enjoy sweet-tasting foods and beverages without the calorie load, making it easier to create a calorie deficit for weight loss.

- **Curbing Sugar Cravings:** Non-caloric sweeteners can help break the cycle of sugar addiction. The sweet taste

they provide can satisfy the craving for sweetness, reducing the need for sugary foods and drinks. This can be especially helpful for those who struggle with intense sugar cravings.



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for 4g^{^^}

*Claim based on considering 2 teaspoons (10 g) Sugar = 40 kcal. Approx. energy expenditure by 60 kg man in walking 4 km/hr = 160 kcal/hr (Dietary Guidelines for Indians – A Manual, NIN, ICMR, 2011). Calories burned during physical activity depends on varied factors including body weight. ^^Product contains Steviol glycosides which is derived from natural source i.e., Stevia plant leaves. *Refer pack for more details. **MRP is inclusive of all taxes



for harmful oral bacteria. Non-caloric sweeteners, however, have a different impact on dental health.

Minimizing Tooth Decay: Non-caloric sweeteners do not

contribute to tooth decay in the same way that sugar does. Since they are not fermented by oral bacteria, they don't produce the acids that erode tooth enamel. This makes them a better choice for oral health in comparison to sugar.

Oral Hygiene Remains Essential: While non-caloric sweeteners are less harmful to dental health, it's important to understand that they do not actively promote dental health. Proper oral hygiene practices, such as regular brushing, flossing, and dental check-ups, are essential for maintaining optimal dental health. Consuming sweet-tasting products containing non-caloric sweeteners doesn't replace these fundamental practices.

Reduced Risk for Children: Non-caloric sweeteners can be particularly beneficial for children, as they help reduce their exposure to sugar and, subsequently, their risk of developing cavities. However, it's crucial to encourage



overall healthy dietary habits and ensure children receive proper dental care.

Impact on the Gut Microbiome:

The gut microbiome, the community of microorganisms living in the digestive tract, plays a significant role in health. Research on the effects of non-caloric sweeteners on the gut microbiome is a relatively new field, and findings are still evolving. Some studies have suggested that artificial sweeteners may influence the composition and function of gut bacteria, which could potentially affect metabolic processes.

Altered Gut Microbiome: Research indicates that artificial sweeteners, specifically saccharin and aspartame, may lead to changes in the gut microbiome. These changes can include alterations in the relative abundance of certain bacterial species. The exact mechanisms and implications of these changes are still under investigation.

Individual Variability: The effects of artificial sweeteners on the gut microbiome can vary from person to person. Individual factors, including genetics, diet, and baseline gut microbiota composition, can influence the extent and nature of these changes. This highlights the complexity of the gut microbiome and its response to dietary factors.

Aiding in Weight Maintenance:

For those who have successfully lost weight, maintaining that weight loss can be challenging. Non-caloric sweeteners offer a way to continue enjoying sweet tastes while keeping calorie intake in check, which can aid in weight maintenance efforts.

Enhancing Compliance with Calorie Goals:

Non-caloric sweeteners can assist individuals in adhering to calorie-restricted diets, which are often recommended for weight loss. By providing a sweet taste without the calorie burden, they make it easier to adhere to dietary guidelines.

It's important to note that while non-caloric sweeteners can be valuable tools in weight management, they are not a standalone solution. Achieving and maintaining a healthy weight involves various factors, including overall dietary habits, physical activity, and lifestyle choices.

Impact on Dental Health:

Dental health is a significant concern when it comes to sweeteners, whether they are caloric or non-caloric. Traditional sugar is a known contributor to tooth decay and cavities, as it provides a food source





In conclusion, non-caloric sweeteners can be valuable tools in reducing sugar intake, managing weight, and providing safe alternatives for individuals with diabetes. They do not significantly impact dental health in the same way that sugar does, and their effects on the gut microbiome are a subject of ongoing research. However, like any dietary choice, moderation is key.

lifestyle practices, non-caloric sweeteners can contribute to a more health-conscious approach to nutrition and overall well-being.

- **Impact on Metabolism:** Changes in the gut microbiome have the potential to influence metabolic processes, such as the breakdown and absorption of nutrients. However, the exact implications of these changes on overall health are still not well understood.
- **Need for Further Research:** It's essential to emphasize that the relationship between non-caloric sweeteners and the gut microbiome is an area of ongoing research. More studies are needed to provide a comprehensive understanding of these complex interactions and their potential implications for health.

It's important to consider the broader context of an individual's diet and lifestyle when assessing the impact of non-caloric sweeteners on health. These sweeteners can be beneficial components of a well-balanced diet, but they are not a panacea. When used mindfully and in conjunction with healthy dietary and

As the body of research on non-caloric sweeteners continues to grow, it's essential to remain open to new findings and ensure that recommendations are based on the best available scientific evidence. By understanding the facts and dispelling myths, we can make informed choices about the role of non-caloric sweeteners in our diets and their potential impact on health.



FRONT-OF-PACK LABELLING FOR FOOD AND BEVERAGES

CHALLENGES AND IMPLICATIONS: PART 2

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nutrients like fibre and protein increase the rating, while negative nutrients like saturated fat, total sugars, and sodium decrease it. No

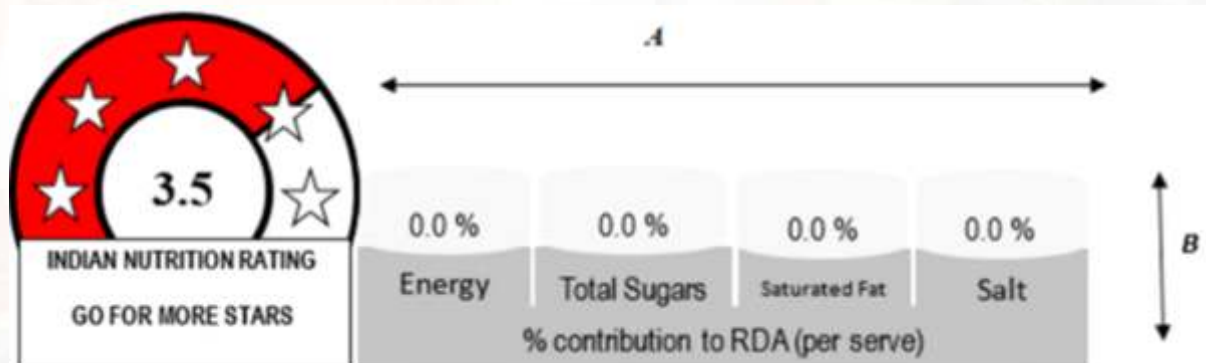
FOPL System in India

After several rounds of discussions with the stakeholders, Food Safety and Standards Authority of India (FSSAI) has proposed draft regulation on Front of Pack Labelling as Indian Nutritional Rating (INR) with similar intent of addressing rising concerns about lifestyle diseases. The central feature of the INR system is a star rating, which ranges from half a star (least healthy) to five stars (healthiest).

More stars a product has, it is considered healthier. The star rating is determined using a specific algorithm that takes into account both the supposedly positive and negative aspects of a product's nutritional profile. Positive

consideration is given to vitamins and minerals as positive nutrients. Below is the visual depiction of INR as proposed to be provided on front of food packages as a mandatory labelling requirement in India.

FIGURE 3



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One of the key aspects of INR regulation is the definition of High Fat, Salt, Sugar (HFSS) foods, as elaborated below: High fat, sugar, salt (HFSS) food means a processed food product which has high levels of saturated fat or total sugar or sodium. The declared values of these ingredients are such that the product; does not satisfy the value of energy (kcal) from total sugar less than 10 percent of total energy, or from saturated fat 10 percent of total energy, and sodium less than 1 mg/1 kcal.

The algorithm for characterizing a food product as HFSS food is based on the concept of daily dietary intake required to maintain healthy diet as per the guidelines by World Health Organization (WHO). Therefore, while WHO's advice is about daily dietary goals, INR applies

those principles to evaluate individual packaged food items. It is a well-known fact that no single food can substitute daily diet. As a result of above HFSS approach, majority of pre-packaged food products will be classified as HFSS foods when the regulation is implemented by authorities. Even 100% fruit juices or those made from fruit concentrates and pulps which provides all its caloric content from the sugar/s naturally present in the juice, will be classified as HFSS foods.

Significant contribution to Indian Food Processing Industry, comes from MSME Sector involved in the manufacturing of popular Indian food products such as sweets, snacks and confectionaries, which with increased acceptance within and outside India is poised for

further growth.

Considering an example here, if one was to calculate rating of popular prepackaged besan laddoo, applying the INR algorithm to besan laddoo using popular recipe, it will score a star rating of 1.5. (See Fig 4).

As per the proposed star rating under INR, besan laddoo will qualify as unhealthy though it is a product well-known for its nutritional value for ages in India and consumed for health benefits. What holds true for besan laddoo with respect to INR rating, will hold true for range of ethnic Indian Snacks such as bhujia, mysore pak, halwa, kaju katli to name a few, when they are sold in prepackaged format.

FIGURE 4

Star Rating Calculation for Besan Laddoo*



Common Ingredient: Besan (Bengal Gram Flour), Sugar, Ghee/Fat, Dry Fruits, Cardamom, etc.

Components	Per 100 ml	Positive Point								
		Baseline points	Energy kcal	Sat. fat (g)	Total Sugar (g)	Sodium (mg)	FV	NLM	Dietary Fibre	Protein
Energy	503.4 kcal	0	≤80	≤1.0	≤4.2	≤90	≤10	≤10	≤3	≤1.5
Protein	10.1 g	1	>80	>1.0	>4.2	>90	>10	>10	>3	>1.5
Carbohydrate	61 g	2	>160	>2.0	>8.4	>180	>15	>15	>6	>2.0
- Total Sugars	46 g	3	>240	>3.0	>12.6	>270	>20	>20	>9	>2.5
- Added Sugars	45.7 g	4	>320	>4.0	>16.8	>360	>25	>25	>12	>3.0
Total Fat	24.3 g	5	>400	>5.0	>21	>450	>30	>30	>15	>5
- Sat Fat	8.3 g	6	>480	>6.0	>25.2	>540	>35	>35	>18	>7
- Trans Fatty	0 g	7	>560	>7	>29.4	>630	>40	>40	>21	>10
- Cholesterol	0 mg	8	>640	>8	>33.6	>720	>45	>45	>24	>15
Sodium	32.5 mg	9	>720	>9	>37.8	>810	>50	>50	>27	>20
		10	>800	>10	>42	>900	>55	>55	>30	>25
		11		>12	>46.2	>990				>30

- Step 1** - Since it is a Solid product, so the category will be category (Table 3)
- Step 2** - INR baseline point = 6 (for Energy kcal) + 8 (for Sat. Fat) + 10 (for Total Sugar) + 0 (for Sodium) = 24
- Step 3** - Final INR score = 24 (INR baseline point) - [0 (FV points) + 0 (NLM) + 7 (Protein Points) + 0 (Fiber points)] = 17
- Step 4** - Star Rating - as per table 6, INR score of 17 is corresponding to "1.5 Star Rating "

*Ingredient proportions are as per popular recipe

FOPL Relevance for India?

Indian cuisine is known for its regional diversity, each state or region has its own unique culinary practices that are deeply rooted in tradition. It has strong influence in driving the preference of Indians for home cooked food. However, changes in standards of living, smaller & working families, preference toward convenience, increased urbanization are factors that drive the shift in the food consumption patterns.

Based on the trends, main sources of food intake may be broadly classified in following three major types.

- Food cooked and consumed at home,
- Out of home consumption (includes consumption in & at conventional restaurants, quick service restaurants (QSRs), office cafeterias and food ordered through online

- ordering Apps),
- Prepackaged food & beverages

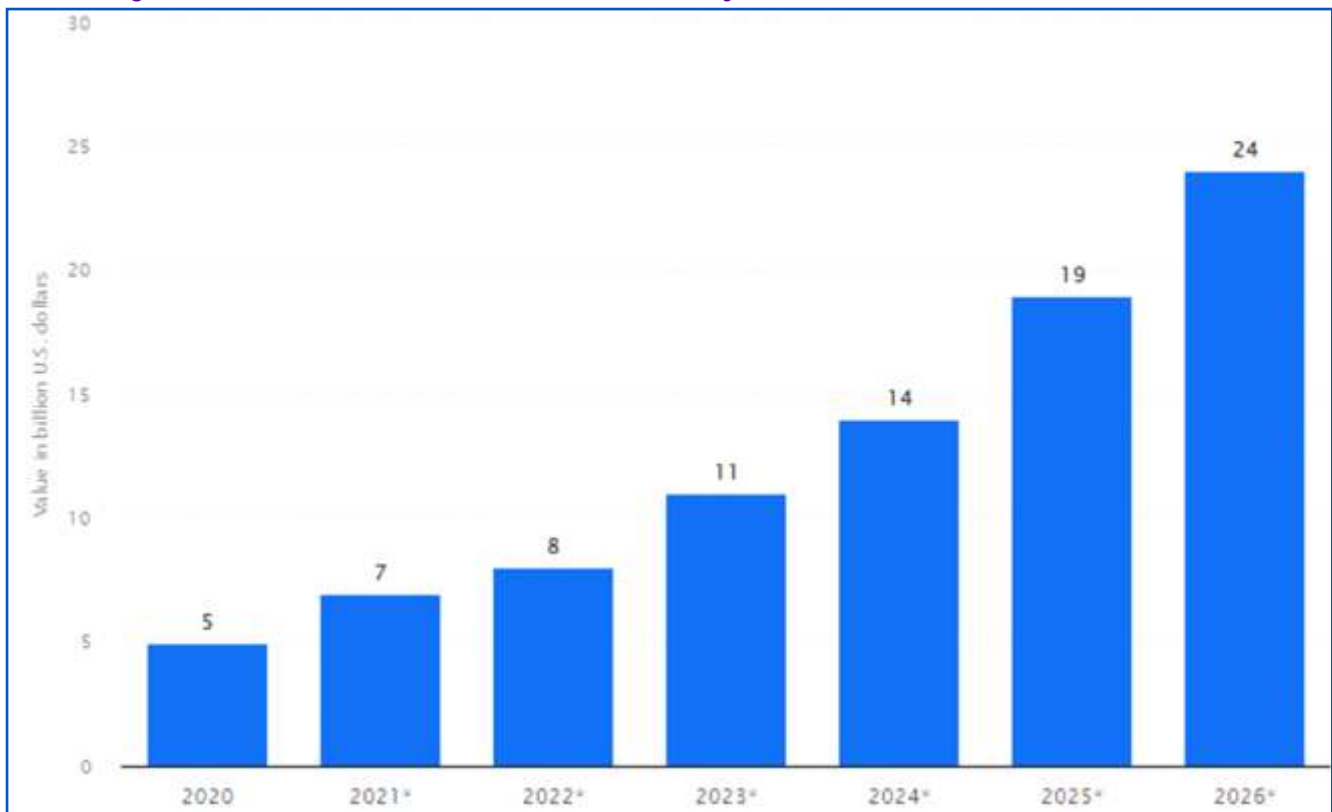
The home-cooked food, is the most significant source of food intake in India, followed by out of home consumption in cafeterias, restaurants, QSRs, plus online food deliveries which are growing rapidly. In 2020, Indian online food delivery market was worth five billion USD. It is expected to reach approx. 24 billion USD, by 2026 as illustrated in Figure 54.

Processed and/or prepackaged food forms the distant third type of food source in India. The level of food processing industry is at nascent stage and accounts for less than 10% of total food in India (Source: Government of India, 2016). As per the findings of study instituted by Ministry of Food Processing Industries (Deloitte study 2020-21), processing levels in India are at 4.5 per

cent for fruits, 2.7 percent for vegetables, 21.1 per cent for milk, 34.2 per cent for meat and 15.4 per cent for fishery. Food wastage remains a concern as nearly forty percent of perishable commodities are wasted in India. It is expected that improvement in food processing would reduce wastages in agricultural produce. Value addition, food processing and better post-harvest management practices have been identified as the key interventions to reduce such loss on a priority.²

The consumption of salt, sugar and fat from first two sources of food intake in India, will therefore be anywhere from 88% to 90%. As a result, linking processed or packaged foods consumption and the rising prevalence of lifestyle diseases requires careful and critical assessment.

Figure 5 - Size of Indian online food delivery market. Source: Statista 2023





nutritional value> Policies should encourage & incentivize innovation and adoption of such processing techniques by the food industry.

thresholds without sound scientific evidence. Food and beverage companies may continue to maintain their existing products due to its taste and appeal while being forced to introduce reformulated products that meet stiff criteria set for FOPL labelling, which may not find acceptance by the consumers.

Discussion:

Following key considerations arise reference discussion on FOPL.

Healthy Lifestyle: FOPL provides only a subset of nutritional information, such as calories, fat, sugar, and salt content. It may not capture other important aspects of a healthy diet. This limited information can lead to an incomplete understanding of a food's overall nutritional quality. Moreover, FOPL does not consider individual dietary needs and preferences as what may be considered a healthy choice for one person may not be suitable for another. Factors like age, gender, activity level, and dietary restrictions should be considered when making food choices. FOPL does not address the quality of ingredients which can influence the nutritional content of a product. For example, no differentiation can be made between polished and unpolished grains or product made from brown rice versus product made from white rice without bran and germ layers, with less fibre content and other nutrients. On the other hand, grain milling is an important processing required to improve keeping quality. There is a need for innovation in the food processing techniques that would help preserve the food with minimal damage to its

A comprehensive approach to nutrition education, access to diverse and wholesome foods, and individualized dietary and physical activity recommendations are of paramount importance in achieving and maintaining a healthy lifestyle.

Diet vs Food Approach - FOPL does not promote a holistic approach to healthy eating, such as considering overall dietary patterns like the Mediterranean diet or plant-based diets. These diets emphasize the importance of a balanced combination of foods rather than focusing solely on individual nutrients to promote health and prevent chronic disease. FOPL often focuses on specific nutrients like sugar or fat. A diet that is low in sugar and fat but lacks other essential nutrients may not be balanced or healthy in the long run. FOPL labels do not consider the context in which a particular food fits into an individual's overall diet. Foods can be part of a healthy diet even if they have higher levels of certain nutrients, as long as they are consumed in moderation and balanced with other nutrient-rich foods.

A fundamental challenge arises due to the food industry's concerns about lack of transparency and setting of the

FOPL applies only to Pre-packaged Food - FOPL is primarily designed for and applied to packaged foods for one to know or be aware of levels of salt, sugar and fat in packaged foods. Such lopsided approach, without factoring how much of these nutrients are consumed from the other two sources namely food consumed at home and out of home consumption, it fails to provide realistic nutrition guidance to the general population. Consumption patterns and preferences for packaged foods vary significantly from one country to another. There is an established trend of higher consumption of packaged and processed foods in western countries. On the other hand, in India, there is a strong tradition of home-cooked meals and an emphasis on fresh and locally sourced ingredients in many regional cuisines. Given this context, applicability of FOPL in India in current and mid-term needs to be re-examined.





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Global interest groups are driving opinions within consumer organizations and media to influence development and implementation of restrictive FOPL regulations targeted at certain prepackaged food groups. It potentially compromises effectiveness or utility of FOPL from overall public health standpoint. Interest groups influence manifests in various ways and impact different stages of FOPL development and implementation. They seem to harp on food industry's profit motive projecting it at loggerhead with the public health goals in general without contextualizing consumption of salt, sugar, fats or additives that would be consumed from non-packaged food sources. Regulatory capture occurs when interest groups exert undue influence over regulatory agencies responsible for designing and implementing FOPL systems. This can lead to regulations that against a particular section of the food industry.

Restrictive Approach - FOPL is restrictive and proposes to limit consumer freedom to choose one's food options. Front of pack labelling is designed in such a way that it directs consumer attention towards specific nutrients like sugar, salt, or saturated fat, potentially leading consumers to believe & make decisions

based solely on these factors without considering the overall nutritional quality of the food. Healthy dietary choices would vary greatly from person to person based on individual dietary needs and preferences. Front of Pack Labelling restrict such variations and impose decisions that have not been inclusive of individual health goals.

FOPL: A Potential Trade Barrier

A question that countries need to ask is 'whether FOPL Guidance as was finalized and adopted by the Codex Committee on Food Labelling in 2021 is a new Note 161 for Labelling?'

Note 161 is a controversial footnote from the Codex General Standard for Food Additives, which states that adoption of codex provisions may be 'subject to national legislation of the importing country'.

The labelling may have potential discriminatory impact on the incoming goods (imports) and increase compliance cost for those trading articles of food. While all stakeholders including National Regulators, Consumers, Industry are taking the health (NCD) challenge seriously, it is crucial that whatever the policy matters on labelling the countries may have, should not be against multilateral trading system under WTO.

When it comes to harmonized approach on food regulations

in international trade and concerns are raised between two trading partners, Codex Standards & Guidelines assume the significance of legal text to settle dispute, if any. In case of FOPL, with the guidelines that were adopted in 2021, Codex seem to direct its member countries to have its own FOPL system. Such an approach tends to be at par with the infamous Note 161 in the Codex General Standard for Food Additives (GSFA) which exempts countries from Codex discipline of globally harmonized food regulations. It is critical that member countries factor Codex FOPL Guidance in context of WTO International Trade Law whether, seeking Codex member countries develop its own FOPL system undermines the harmonization goals and gives rise to trade barriers.

Absence of a globally harmonized FOPL system has led to proliferation of multiple labelling schemes, creating confusion for both consumers and manufacturers. The lack of global standardization in front-of-pack labelling (FOPL) is a significant challenge in the design and implementation of these labelling systems.

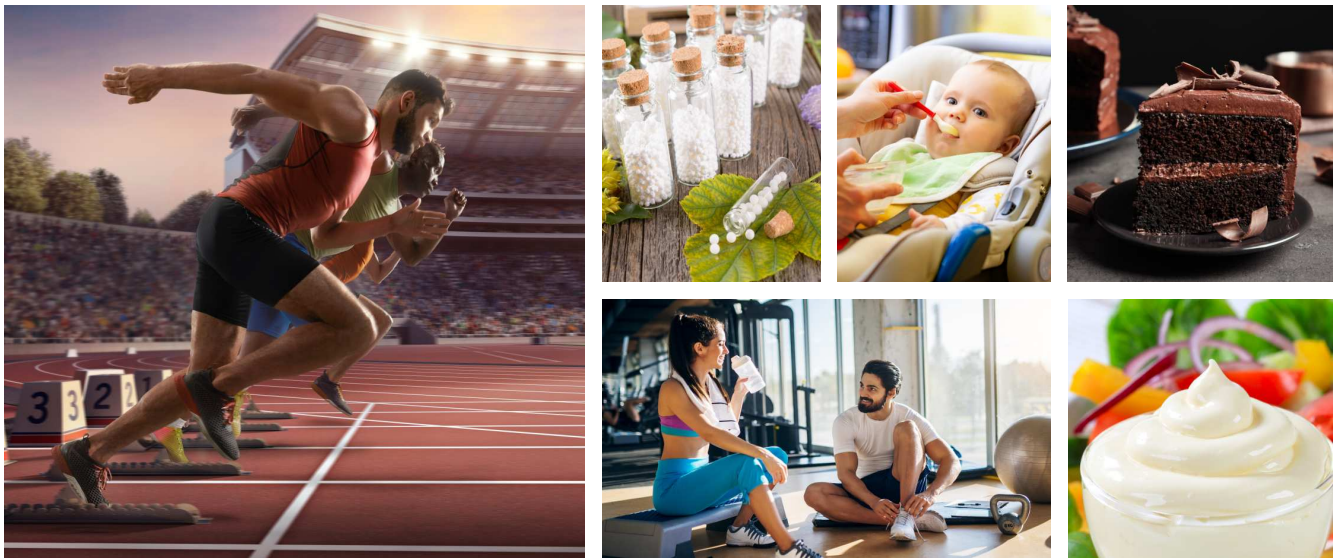
FOPL is intended to provide consumers with clear and consistent information about the nutritional content and quality of foods and beverages. However, absence of a unified global FOPL poses several challenges such as,





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and barriers, affecting international commerce.

Lack of harmonized approach on labelling raises several serious issues as below,

a. Multiple FOPL Systems:

Different countries and regions have developed their own FOPL systems with varying criteria, thresholds, symbols, and formats. For instance, the traffic light system in the UK uses color-coded symbols to indicate the levels of key nutrients like fat, sugar, and salt, while the Nutri-Score system in some European countries employs a numerical score and a color-coded scale. Such lack of consistency would lead to confusion for both consumers and manufacturers operating in international markets. In a globalized marketplace, consumers are often exposed to products from different countries that may carry distinct FOPL labels. The presence of multiple FOPL systems makes it difficult for consumers to understand and compare nutritional information across products.

b. Industry Compliance

Challenges: Food manufacturers that operate in multiple countries face the challenge of complying with diverse FOPL regulations. Adhering to different labelling requirements can be resource-intensive and complex, potentially affecting product availability and cost.

Inconsistent FOPL regulations can have trade implications. Countries with conflicting FOPL standards may face challenges in exporting or importing food products. This can result in trade disputes

I. One of principles of Codex standard setting is 'Universality'. Universality may be defined as 'quality of being true in or appropriate for all situations'. Lack of universality in FOPL guidelines raises important question about soundness of its scientific basis. Almost all the FOPL systems are threshold driven with inadequate scientific evidence in support. The so set thresholds simplifies complex dietary issues and vary not only from country to country but regions within one country and across demographic groups within the region.

II. The evolution and subsequent proliferation of FOPL systems around the world is largely presented as scientific, however there is no evidence-based science backing it, other than surveys and review papers citing how FOPL influences consumer's purchase behaviour. There is no hard and credible epidemiological evidence in peer reviewed scientific literature whether FOPL is indeed improving public health.

III. The potential risk, therefore, in immediate or short term is, fragmentation of global food trade and adverse impact on processed food that is traded across countries, should the national governments/regulators resort to re-shoring or friend shoring

when mandating FOPL regulations as per Codex advise. It may result in food trade getting reoriented along countries or regions adopting to one set of FOPL either for ease of trade or supporting aligned trade treaties.

It may be noted that the EU's Farm to Fork Strategy, which is at the heart of its Green Deal, is set to propose harmonized front of-pack nutrition labelling across EU very soon. Such a multipolar approach may have its upside, but goes against the tenets of WTO, and must be considered at the highest level in Codex Alimentarius Commission, by the National Regulators with respect to relevance, utility and efficacy of FOPL.

Way Forward

Hippocrates' quote 'Health is the greatest of human blessings' emphasizes importance of good health in one's life. It underscores foundation for better understanding of maintaining and promoting health. Balance, variety, and moderation in diet coupled with regular physical activity commensurate with one's age, gender, and body constitution are the key principles of healthy lifestyle. In addition to these principles, factors for instance, stress, inadequate hydration, habits such as smoking, excessive alcohol consumption etc., have a bearing on for healthy lifestyle. Therefore, it should be noted that, it is not a single food, or the diet alone that contributes to overall well-being.

Nutrition experts and dieticians often share the perspective that no food is inherently “good” or “bad” and advise to focus on making right dietary choices. Portion sizes play a crucial role in determining whether a food is contributing to a balanced diet or not. No single food can guarantee perfect health, it is dietary patterns which play a significant role in promoting health and reducing the risk of diseases.

objectives by the FOPL advocates, the unintentional consequences of setting up policies that are just an import of what is happening in other regions, countries and markets require a deeper data driven probing by all the stakeholders to examine its relevance to India. It is only prudent to review the ‘imperious immediacy of interest’ of implementing FOPL Regulation by factoring whether the projections made about it will realistically translate in public health gains or nutrition/diet literacy for consumers at large and encourage the stakeholders beyond the packaged food industry in making suitable changes in their food offerings.



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It is clear that countries and regions have adopted varying approaches to address issues based on specific circumstances and priorities. Therefore, it is prudent for India to review proposed FOPL policy measures through lens of relevance, its effectiveness to deliver public health goals, impact on Indian Food Processing industry that comprises of SME, MSMEs, Start-Ups and unintended long-term consequences of FOPL regulations.

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RESISTANT STARCHES AND HEALTH BENEFITS



AUTHOR
Dr Shashank Bhalkar,
 Executive Director,
 PFNDAI

Foods containing high starch have very high Glycaemic Index (GI). It is observed that cooking and chilling of high starchy products results into reduction of GI.

According to one report (1), chilling freshly cooked white or milled rice to 4°C or freezing results in reduction original high Glycaemic Index (GI) of 91.08 to GI of 84. At the same time resistant starch content was also observed to be increased. Other studies indicated that chilling and storage for 24 hours of resulted in reduction in digestibility and GI, of both brown and milled rice. Similarly (2), when glycaemic response of white bread as such or processed with different conditions such as freezing and defrosting, toasting, toasting after freezing and defrosting was studied, it was observed that

compared to fresh bread it was always lower in case of other processing methods. Lower Glycaemic index means lower the rate of release of sugars in the blood.

These are some of the examples about how glycaemic index of high starchy foods is affected because of processing and subsequent reduction of temperature for storage. This happens because the starch in these materials or products converts into "Resistant starch" (RS). Resistant starch is the one which escapes from the digestion in the small intestine of healthy individuals, therefore there is no rise in the blood sugar levels as compared to other starches. This undigested starch is then fermented by microbiota in the large intestine to give health benefits similar to soluble fibres which include, production of short chain fatty acids (SCFAs), increase in bacterial mass and promotion of butyrate producing bacteria. This kind of reduction of GI is typically because of phenomenon called

as "starch retrogradation." (3) During retrogradation process, when the gelatinised starch is cooled and left for longer period, the linear molecules amylose and linear part of amylopectin molecules rearrange themselves again to more crystalline structure. These retrograded starches are resistant starches. There are various other reasons why we find of "Resistant Starch" naturally occurring or as a result of some chemical processing. They are categorised into five types as follows. (4), (5), (6)

- RS1: Physically inaccessible or undigestible resistant starch found in unprocessed whole grains and seeds or legumes. This is because the starch is bound within fibrous cell walls and therefore inaccessible to enzymes in small intestine.
- RS2: The starch is inaccessible to the enzymes because of starch structure, making amylases in the intestines unable to act. The examples are raw potatoes, green bananas, lentils and high amylose corn starch

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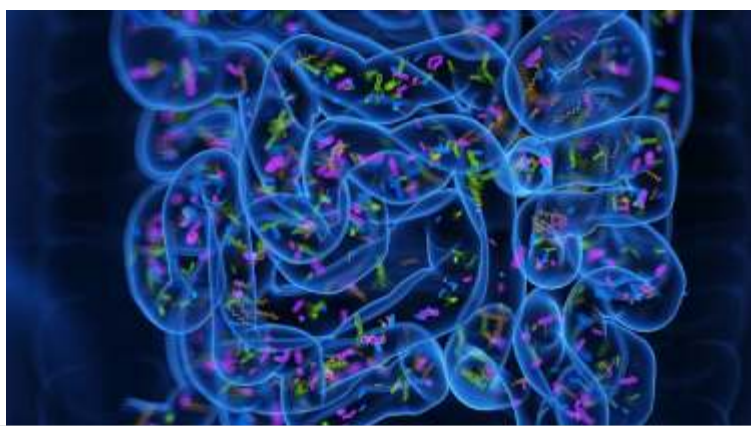




- RS3: This is formed when the products which are high in starch like potatoes, rice are cooked and cooled. They are retrograde starch. Typical example is pastas. This is explained at length in the discussion earlier.
- RS4: Starches chemically modified to resist digestion. Such starches are produced by chemical modification via conversion, substitution and cross linking of starch molecules in such a manner to reduce digestibility.
- RS5: Products complexed with oils. They are formed by heating and cooling of certain starches with oils, thereby changing their structure to make them resistant to digestion. Example (7) is formation of amylose lipid complex by addition of oil while cooking rice, resulting in reduction of digestibility.

The property of these starches of not getting digested by amylases and being fermented in large intestine to produce SCFAs, offer several physiological benefits when they are consumed (8). There is an excellent review of the literature about the various physiological benefits of Resistant starches in the article by Adriana et al (9) which is described below.

propionates. This then results into lowering of pH of large intestine. Which in turn reduces pathogenic bacteria and increase the beneficial bacteria. Butyric acid helps to maintain normal state of colonic epithelium by nourishing the colonocytes. In vitro studies indicate the inhibitory effect of butyrate on cancer cell proliferation due to the process of arresting one phase of the cell cycle. Reduction of bowel time because of RS in the diet may help in prevention of colorectal cancer. In a study when RS was combined with insoluble fibre like wheat bran, more butyrate was observed in the faeces. When it was combined with soluble fibre like Psyllium, RS fermentation was shifted to terminal part of colon, where most cancerous lesions are formed. This may have beneficial repercussions on colorectal cancer prevention. The caution is, in addition to SCFAs, gases such as hydrogen, methane and carbon di oxide are released in intestine. This,



Gut health: Data suggests that microbial fermentation of RS leads to production of SCFAs such as lactic acid, acetate, butyrate and

may create discomfort, especially for people suffering from conditions like Irritable-bowel-syndrome.

Glycaemic management:

Monitoring and maintaining adequate glucose and insulin levels is essential for both diabetic and healthy individuals. Foods containing RS's digestion process is slower as compared to that containing only rapidly digestible starch.

Consequently, such foods lead to slow release of glucose into blood stream and help maintain the sugar levels. Therefore, they are also termed as low GI foods.



Carbohydrate metabolism:

Recently, many animal studies were carried out to find effect of consumption of RS on glucose metabolism. Some studies indicate inducing insulin secretion. Other studies indicate the consumption of RS enhance insulin sensitivity by reducing ectopic adipose tissues. There is no conclusive evidence for either. More studies are required to show the effect of RS consumption on insulin related parameters.

Lipid metabolism: The effect of consumption of RS on lipid metabolism in both animal and few human trials was studied. Consumption of RS leads to release of SCFAs in large intestine to bring in positive changes in microflora.

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individuals who consume RS for the purpose of weight management.

SCFAs are utilised in colon epithelial cells where butyrate is primary energy substrate for colonocytes; in liver cells where most (50 - 70%) of the acetic acid and rest of the butyrate, propionate is metabolised, and muscles generate energy using remaining acetate. Acetic and propionic acid regulate lipid and cholesterol mechanism. RS3 has shown to bind bile salts and restrict bile acid absorption in the ileum, stimulating bile acid production in liver. This binding effect is absent in other types of RS. In case of overweight and obese individuals, the RS rich diet reduces total cholesterol and non-HDL cholesterol.

Body weight: RS is shown to control weight and can be beneficial in preventing overweight and obesity. This could be because of several reasons. RS is not absorbed in small intestine and therefore reduce calorific density of the food. SCFAs produced by fermentation may increase total energy expenditure and fat oxidation. Also, RS will suppress appetite due to the increased production of satiety signals such as PYY and GLP-1, reducing caloric intake. In a study of healthy vs hyperinsulinemia individuals, it was observed that the resistant starch averaged 2.8 Kcal per g in healthy individuals and only 2.2 in case of hyperinsulinemia individuals (10). This will have overall positive effect for the

This recently found physiological benefits of resistant starches have led to the new applications in foods. This makes them utilisable to make so many food applications, designed to meet special physiological and medical needs (11).



When macaroni was prepared by adding 7.5% of RS2 in Semolina flour the product was brighter in colour, and sensory properties as compared to the control (13). Thus, increasing interest about the Resistant starches amongst both Nutritionists and Food product developers because of the physiological properties as well as physicochemical properties such as swelling, viscosity, gel formation and water binding. High fibre containing foods are coarser, denser and relatively less palatable than refined processed foods. When Resistant starches are used to replace fibres, do not change the taste, or significantly change the texture and improve sensory properties while giving benefits of fibres. They have small particle size, white colour, bland flavour and are good to handle in processing. They impart

crispiness, expansion, and improved texture of the final product. These properties can make it possible to replace them with flour 1 to 1 basis without altering dough handling or the rheology. When it comes to food fortification with fibre, use of RS gives special characteristics which are otherwise not attainable for such products. Substitution of 3% milk solids with specially made RS starch gives better viscosity and decreased syneresis of yoghurts.

Unlike natural sources like RS, commercially manufactured RS are not affected by processing and storage conditions. For example, RS2 in raw bananas decrease with ripening while such is not the case with Hi-maize which is commercial form of RS. There is a possibility to produce RS with desired rate and extent of digestion and RS with desired rate of hydrolysis and fermentation in colon as per the need of the nutritional functionality. The industrial application has scope for wide range of products. This includes bakery products such as bread and muffins or breakfast cereals using RS as a source of fibre.

The amount of RS used to replace flour depends on the desired level of fibre. RS in baked, pasta products and beverage give better texture and health benefits. RS can improve expansion of extruded cereals and snacks.



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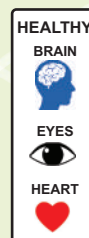
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Such a range of products will be increasing as knowledge about their physiological and physicochemical benefits will expand. There is a bright future for these exciting food

In the thickened health beverages, they are superior to using insoluble fibre which requires suspension add opacity to the beverage. They offer lesser gritty mouthfeel and better flavour. Arimi et al (14) have successfully replaced most or all the fat in imitation cheese with RS, without adversely affecting meltability or hardness, at the same time giving advantage of functional fibre.

Amongst the new developments is the insoluble resistant maltodextrins with functionality similar to RS. Chemically modified starch such as phosphorylated starches are also non digestible and are categorized as RS. Similarly, RS content of citric acid modified starch depends on degree of esterification. With the development of so many new varieties of RS, there will be challenges of regulatory approvals.

ingredients. There is great scope for the development of the functional foods based on these ingredients which will meet both physiological needs and will have superior functional properties.

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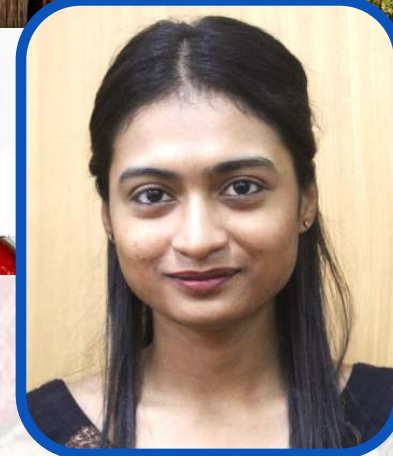
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FOOD COLOURS- MAKING THE FOOD ENJOYABLE!

AUTHOR

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Food acceptance is significantly influenced by its appetizing colour. Natural food has a distinctive colour because of the pigments that are already there. When food products are being prepared, colourants may occasionally be added to enhance their aesthetic appeal. Consumers' ability to recognise flavour and quality is greatly influenced by colour. The use of food colours in India has been rising steadily with the synthetic colours market rising from over US\$ 26 million to US\$ 70 million by 2030 (1) while natural colours may rise from US\$ 74 million to over US\$ 90 million (2).

Why Are Food Colours Used (3, 4)

As mentioned above people are attracted to food when it looks very appealing. Colours make the foods appealing. The colour of the food makes the

first impression on consumers. When they choose fruits, they first look at red apples, yellow bananas or orange mango and then they smell them for a second impression. Colour gives a better chance for food to be selected. Many times, the natural colour of the food is attractive enough so no need to add colour, but when natural colour is not attractive enough then colours are used.



It is also that food ingredients do not have the same uniform colour because of natural variation. So, colours are used to ensure uniformity of colour. Different shades of ketchup or jam in the same lot will prevent consumers from buying it thinking that there may be some problem.

Natural pigments in foods are also not very stable so over time they fade, but synthetic are much more stable and resist fading. Even after quite some time, the food retains its colour.

Some of the nutrients such as carotenoids and some flavours get protection from the colours added. Food products may be exposed to a variety of temperatures, humidity, light, oxygen etc. which can degrade these nutrients and flavours as well as some natural pigments in foods. Added colours offer protection to these.

People associate many flavours with colours e.g., red with apple or strawberries, yellow with bananas, orange with fruit orange, yellow with mango etc. So, if the food preparation does not have these colours, they do not associate them with those foods.



Natural and Synthetic Colours

Food colours may be natural or synthetic. Natural food colouring comes from a variety of edible natural sources, including fruits, vegetables, herbs, spices, algae, etc. When added to food or drink, they provide a diverse colour range. The natural colours found in foods include chlorophylls, anthocyanins, carotenoids, betanin, annatto, etc. Synthetic food colours are also known as artificial colours. These are produced through chemical reactions, and the food and pharmaceutical sectors frequently use them.

Natural colours are obtained from naturally occurring sources. Based on the presence of bioactive substances like provitamin A activity and carotene, natural colourants from the carotenoids group offer a range of health benefits. Anthocyanin is another natural colourant that has positive health effects. It has a cancer-preventive mechanism. Natural food colourants are available in a wide range of colours. They are used in a variety of dishes like beverages, dairy products, baked goods, etc (5).

Synthetic colourants are substances not found naturally

and are prepared artificially. Synthetic food colouring has a number of economically significant advantages over natural colouring, including low cost, great colour

stability, and resilience to light and pH. Due to their low cost, easy availability, ease of application, more colour stability, etc. synthetic food colours have been employed more frequently than natural food colours. The shelf life of synthetic food colours is also longer than compared of natural ones. But if consumed in large amounts or more than the permitted limit can be harmful (6).

Colours Permitted by FSSAI

Only food colours that have been approved by the FSSAI may be used in food products. Natural permitted colours include carotene, chlorophyll, riboflavin, caramel, annatto, saffron, and curcumin or turmeric. However, even if caramel is not present naturally, it is considered a natural colour probably because it is formed in many home-cooked foods like bread, sugar syrup and many baked goods. The synthetic permitted colour includes yellow shades like (tartrazine & sunset yellow FCF), red shades like (ponceau 4R, carmoisine & erythrosine), blue shades like (indigo carmine & brilliant blue FCF), & green shades like (fast green FCF) (7).

The maximum limit of permitted synthetic colours used in most food products is up to 100 mg/kg while in some

cases it is allowed to be used up to 200mg/kg. For example, in products like candid/ glazed/ crystallized fruit including murabba, the following synthetic colours are permitted- Allura red AC and erythrosine at 100mg/kg, while brilliant blue FCF, fast green FCF, indigo carmine, Ponceau 4R, sunset yellow FCF & tartrazine can be used at 200mg/kg. Even some natural colours have limits to be used in food products (8).

All food colours including natural colouring matter, permitted synthetic colours and their preparations or mixes shall only be marketed under the BIS certification mark. The colour preparations may come in a powdered or liquid form(9).

Conclusion

Colours play an important role in the food processing industry. We cannot imagine food without colour. Food and its components become much more visually appealing and palatable when coloured. Can you imagine yourself buying a tomato sauce bottle that appears brown while it is on the shelf? No right, because we love the red colour of our tomato ketchup. These examples highlight how crucial it is for food processors and manufacturers to consistently provide foods with a consistent tint.





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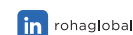
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The quantity of processed foods has expanded in the past few years. To ensure the quality of processed meals, certain food additives are used. To provide an attractive colour to the food products, natural or synthetic food colours are added. The colours whether natural or synthetic should be added within the permissible limit and only permitted food colours should be used to maintain the quality as well as human health.

These colours are thoroughly tested for their safety. The regulatory agencies like FSSAI then decide how much of these colours could be added to different food products. Anything more than the limit is harmful. So, the colours used should be within the limit suggested by FSSAI. When any colour is found to be unsafe for use in foods, it bans it.

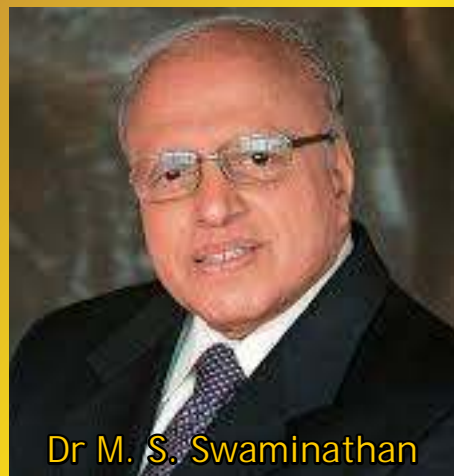
Only safe colours are allowed to be used in food products and at the levels considered safe by it.

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WEBINAR ON EMERGING TRENDS IN WHEAT PRODUCTION AND UTILISATION



Dr M. S. Swaminathan

PFNDAI organized the webinar in collaboration with the Wheat Products Promoting Society (WPPS) on the 13th of October 2023. The webinar sponsored by Marico, was dedicated to commemorate the Late Dr M.S. Swaminathan- Father of India's Green Revolution. He was the founder of MS Swaminathan Research Foundation.

Dr Shashak Bhalkar, Executive Director, PFNDAI, gave an



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Ms Simran Vichare,
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opening address to start the webinar. He started with a presentation and gave an overview of the schedule and heartily welcomed all the speakers and attendees. He started his talk by remembering Late Dr M. S. Swaminathan, who was an Indian agronomist, agricultural scientist, plant geneticist, administrator, and humanitarian.

Later Dr Bhalkar explained how post-independence India became a food-independent country from a food-dependent country due to efforts taken by Dr Swaminathan. He also mentioned about 'Wheat Revolution' started by Dr Swaminathan and the 'Wheat Revolution' stamp which was introduced by then Prime Minister, Shrimati Indira Gandhi. Dr Swaminathan was rewarded with numerous awards, like the first World Food Prize, the UNESCO Gandhi Gold Medal, and many such esteemed recognitions. Later, a small clip of Dr Swaminathan was shown



where he was talking about food security and the legal right to food; he ended his talk by saying 'Future belongs to nations with grains, not guns'.

After this, Mr. Ajay Goyal, Chairman, WPPS gave an



Inaugural address and gave a gist on Wheat Products Promotion Society (WPPS). He began by explaining how wheat consumption by the society has increased as a result of an increase in population and the production is not enough. Therefore, the challenge to produce better varieties of wheat and make higher yields is faced by industries.



The theme address was delivered by **Dr Murli Krishna**, former Chairman and Managing Director, of Modern Food Industries Ltd. He mentioned how many agricultural scientists including Dr Swaminathan transformed India into a food surplus and exporting country. He presented statistics that by 2050, our population is going to reach 1.7 billion and naturally our food requirements are also going to increase and are estimated to be around 430 MT from 370 MT and wheat will continue to play a very dominant role in meeting food security needs as it is the second largest cereal produced today. He later pointed out other future food security concerns like urbanization and how agricultural scientists, food technologists, and food processing experts are working

towards making wheat products nutritious, affordable, and acceptable to consumers by biofortification or in-process fortification to make wheat wholesome. He said the mantra is 'Produce more from Less' and that our technology should enable us to increase the net need of food from raw material that goes for processing and that is a challenge for wheat utilization industries.

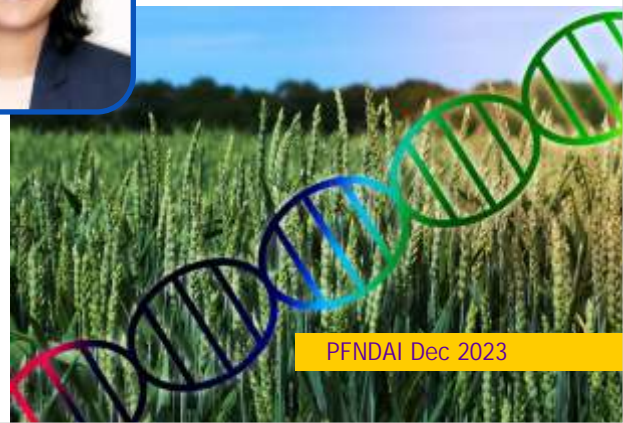
Then **Ms. Dolly Soni**, Manager- Marketing and Projects, of PFNDAI and Webinar Convener introduced all the speakers of the event.



Dr Sewa Ram, Principal Scientist (Plant Biochemistry) and PI, Quality and Basic Sciences, ICAR- Indian Institute of Wheat and Barley Research

gave a talk on 'Recent Advances in the Development of Wheat Varieties for Better Health and Wellness'. He mentioned despite difficulties, India reached its highest productivity record for wheat which is, 112.74 MMT, he also showed a timeline for the same up to 2050 years. He highlighted, quality traits in wheat and how earlier we used to produce only hard wheat and now there are varieties.

Various genome editing techniques can be introduced in the future to improve wheat quality.



The next talk was by [Dr Arun K. Joshi](#), CIMMYT Asia Regional Representative and MD, BISA, International Maize and Wheat Improvement Centre (CIMMYT) & Borlaug Institute for South Asia (BISA) presented on: 'Way Forward to Meeting the Food and Nutrition Security of India by 2050- Role of Wheat'.

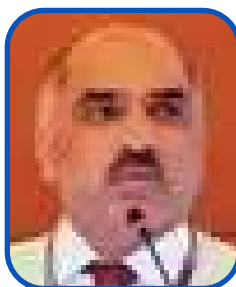


Due to his traveling schedule, he was not able to deliver his talk directly on the platform but his video presentation was played for the viewers. He stated how wheat production in India is increasing but still the total population is undernourished according to FAOSTAT 2021.

He stated that the demand will increase by 2050 thus production should also be upscaled. He pointed out challenges for wheat crop

production and survival major being the climate change and technologies that should be developed to overcome these challenges.

Next, [Mr B. S. Muralidhara](#), Senior General Manager, Buhler (India) Pvt Ltd. spoke on 'Advances in Milling and Baking Technologies for Better Sustainability and Improved Product Quality.'



He commented on how there are Globally changing markets due to high population, changes in eating habits, demand for convenient food, and various emerging consumer trends in the food industry. He then showed various machines used for wheat production.

The last talk for the day was delivered by [Mr V. V. S. Mani](#), Director of Operations, UNIBIC Foods, focused on 'Wheat Quality and Functionality for Meeting the Requirements of the Emerging Diversified Bakery Product Needs'.

He began by mentioning standard bakery products and other value-added products that are catching up in the Indian market. He explained how wheat flour is important from a Bakery Manufacturer's point of view and how there should not be a varying quality of flour for a particular product; for this, he suggested that there should be a close liaison between the miller/supplier and baker.



After each talk, the speakers enthusiastically responded to all the queries that were asked by the viewers. The webinar was willingly participated by around 184 participants which included individuals from Industry and Academics and even students.

Afterward, Ms Dolly Soni introduced the moderator and members of the Panel discussion. The Panel Discussion started wherein [Dr B. Sesikeran](#), Chairman, Scientific Advisory Committee Hon. Scientific Director, PFNDAI, Former Director of NIN (ICMR) was the Panel Moderator. Two Panel members were present namely, [Dr Suresh Itapu](#). CEO, NutriTech Consulting Services Pvt Ltd., and [Dr Agatha Betsy](#). Manager- Nutrition, Marico Limited.





Dr Sesikeran began with the panel discussion and asked questions pertaining to important issues like Gluten allergy, Wheat for Nutrition Security, Cereal protein quality, and Applications of Wheat in the manufacture of Plant-based meat, etc to Dr Itapu and Dr Betsy. Both panellists provided detailed

responses, to which Dr Sesikeran added valuable insight. He made the entire discussion very live.

Lastly Vote of thanks was presented by Mr Raj Kapoor, Managing Director, Assocom-India Pvt Ltd. He acknowledged all the speakers, panel members, the

team of PFNDAI and Marico for successful event, and the attendees for patiently listening throughout. To end the session, Ms Dolly Soni gave a closing message. The entire webinar recording is available on the following link (https://fb.watch/nRSOBYK_Am/)



'NON-CALORIC SWEETENERS: SCIENCE, SAFETY & USE'

WEBINAR REPORT

by

Ms Simran Vichare,
Nutritionist, PFNDAI



Protein Foods & Nutrition Development Association of India (PFNDAI) Organized a Webinar on 'Non-Caloric Sweeteners: Science, Safety & Use' in collaboration with Coca-Cola India Pvt Ltd. on the 31st of October 2023.

During the opening address of the webinar, Dr Shashank Bhalkar, Executive Director of PFNDAI, welcomed all the speakers and attendees. He



gave an overview of the topic, which focused on the science, safety, and use of non-calorie sweeteners in the diet.

He emphasized that sugar consumption is linked to obesity, diabetes, and other chronic diseases and mentioned that high-energy diets in India contribute to non-communicable diseases (NCDs). In contrast, artificial sweeteners have been found to provide sweetness with minimal calories.



He acknowledged the existence of myths surrounding non-calorie sweeteners. He highlighted the fact that these sweeteners undergo approval processes and that regulatory agencies define acceptable daily intake levels. Dr Bhalkar said that the webinar would feature expert insights from various fields, including Medicine, Toxicology, Regulatory, and Nutrition.

Following that, Ms. Dolly Soni, PFNDAI's Manager of Marketing and Projects and Webinar Convener, greeted and introduced each of the event's speakers.





The first talk was delivered by **Dr Mangesh Tiwaskar**, who is a renowned Diabetologist, in Mumbai. He discussed the controversy surrounding non-nutritive artificial sweeteners (NNAS).



He mentioned that extensive premarket safety studies are conducted by various FDAs and that global diabetes, endocrine, and dietetic associations and the National Cancer Institute consider FDA-approved non-nutritive sweeteners to be safe.

He also covered various topics related to NNAS, such as their characteristics, effects on body weight, metabolic health (with a focus on diabetes), dental health, cancer, gut microbiota, and renal toxicity. His talk included references to scientific studies and systematic reviews. He concluded by stating that NNAS has been well addressed in terms of their effects on gut microbiota and cancer.

The next speaker was **Ms Jie Ling Teo**, Senior Regulatory Affairs Executive, Food Industry Asia. Her topic was, 'Science-based Approach for Labelling of Sweeteners- Global vs Local



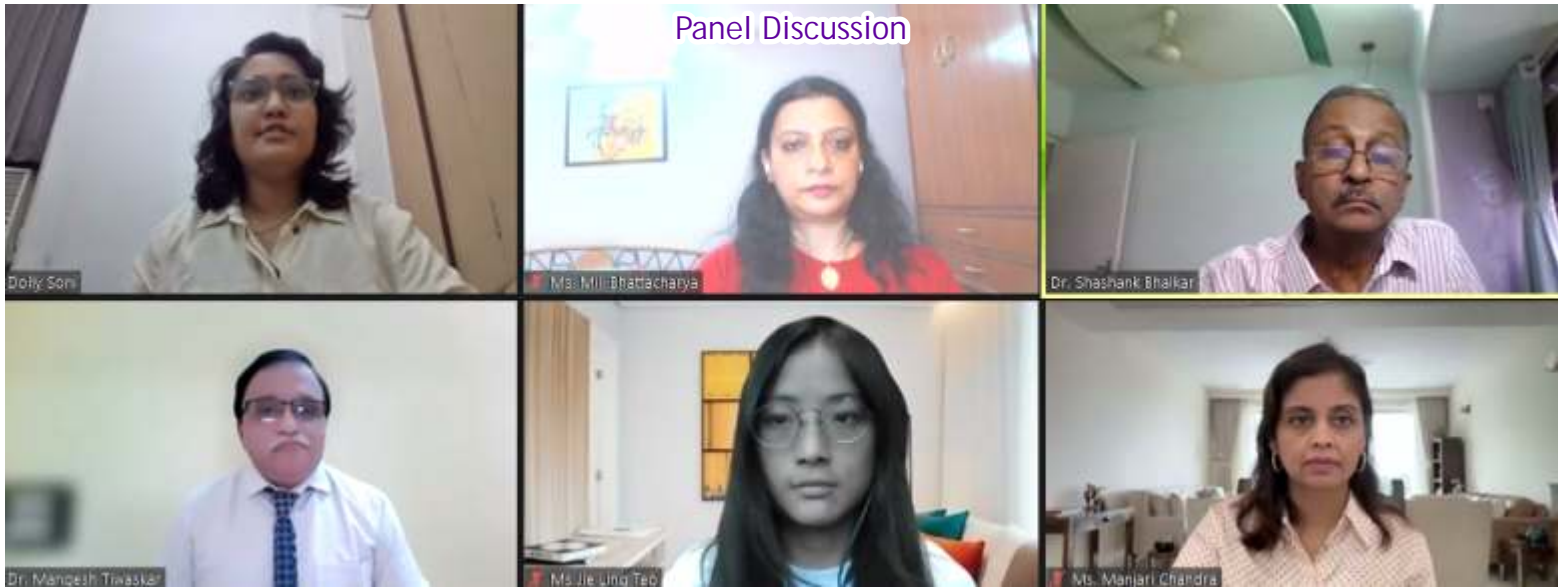
Perspective'. She started by discussing the importance of adopting a science-based approach to labelling sweeteners in the food and beverage industry. She highlighted the growing policy pressures to address obesity and non-communicable diseases, as well as the shift towards healthier lifestyles among Asian consumers. She also emphasized, the World Health Organisation's guideline on the use of non-sugar sweeteners (NSS) and the evaluations of aspartame by IARC and JECFA. Ms Jie provided insights into stakeholder perceptions of sweeteners in various Asian markets and the responses by regulators and policymakers. She also highlighted the variations in sweetener labelling among different

geographies and provided recommendations for stakeholders to promote a science-based approach towards sweetener labelling.

The last talk was by, **Dr Irina Dahms**, a Toxicology Expert, from The Coca-Cola Company, Atlanta who presented on 'Hazard vs Risk - Role of Scientific Risk Assessment for Approval of Sweeteners'.



She started by giving a very simple example of distinguishing between a hazard and a risk and carried out her discussion on how to do a risk assessment of food additives. She outlined the four steps involved in risk assessment: hazard identification, dose-response assessment, exposure assessment, and risk assessment. She also explained the importance of dose in determining the toxicity of a substance and the establishment of an acceptable daily intake (ADI) as a safety measure.



A case study on the sweetener aspartame was also presented, highlighting the divergent opinions on its potential carcinogenicity and the reaffirmation of its safety by national regulators. Dr Irina concluded her talk by saying that regulatory decisions should be based on science-based risk assessments rather than just hazard identification to avoid consumer confusion.

Moving ahead, Ms Dolly Soni introduced the moderator for the Panel discussion, **Dr Jasvir Singh**, Director, Head- AMETI Regulatory Affairs International Flavors and Fragrances. She also welcomed and introduced the Panellists, **Ms. Manjari Chandra**, Nutritional Medicine Senior Consultant- Max Healthcare Delhi; **Ms. Mili Bhattacharya**, Scientific and Regulatory Affairs Coca-Cola India; and **Ms Naaznin Husein**, Founder Director- Freedom Wellness Management Chairperson - Nutrify Today Dietetics.



Dr Jasvir Singh began with the panel discussion and proposed the first question to **Ms Manjari Chandra** pertaining to the use of non-caloric sweeteners in clinical settings. For which she agreed that the use of sweeteners is permitted in the clinical setting to reduce dependency on insulin and drugs but focusing on type, amount and behavioural change to reduce the craving for sugar is also important.

Ms Naaznin Husein spoke on the role of sweeteners in diet management, she talked about how the sweet taste has been an integral part of traditional customs and change that will be difficult. She said, 'It is easier to change a man's religion than his eating habits' and therefore our main focus should be to change this behaviour as the sedentary lifestyle has set in.



Dr Jasvir asked **Ms Mili Bhattacharya** about the role as well as the challenges faced by the food industry in regard to sweeteners. She mentioned sweeteners have immense opportunities for industries as well as consumers and they offer a very well-proven technological tool which can be used in a very minimal amount in diverse categories of foods and beverages. Questions pertaining to consumer policies, acceptability of sweeteners were addressed by the panellists.



Lastly, the vote of thanks was presented by Ms Dolly Soni. She acknowledged all the speakers and Panel members and also thanked Coca-Cola India Pvt Ltd for sponsoring the webinar along with the audience for making this webinar a success. The entire webinar recording is available on the following link (<https://fb.watch/o4dUkWIYdV/>)

REGULATORY ROUND UP



AUTHOR
Dr Shashank Bhalkar,
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Dear Readers,

Season's greetings and happy and healthy 2024 to you.

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

[List of Referral Food Laboratories for testing of fortificants in Fortified Rice \(FR\), Fortified Rice Kernel \(FRK\) and Vitamin-Mineral Premix for Fortified Rice Kernel](#) The order gives the list of Referral Food Laboratories for testing of FR, FRK and Vitamin Mineral Premix for FRK. Samples failing in primary testing laboratories are referred to these laboratories.

[Strengthening the Quality Control Mechanism of FR, FRK and Premix for FRK](#) Food Authorities have suggested measures to strengthen the mechanism of Quality Control for FR, FRK and Premix of FRK. FBOs manufacturing FRK and premix of FRK shall be required to obtain FSSAI license. Those

who are operating under Registration should apply for licence within three months.

Test reports of every batch of FRK and FRK premix, tested in FSSAI notified laboratories shall be uploaded on FoSCoS portal. While uploading, there should be self-declaration regarding source of iron and blending ration of FRK with rice. Manufacturers of FR and FRK should procure the raw materials only from FSSAI licensed vendors with copy of test reports of FRK and Premix tested in notified laboratories.



[Approved test methods for detection of Iron, Folic Acid & Vitamin B12 in Fortified Rice Kernel](#) Scientific panel has suggested method of sampling and testing for detection of

Iron, Folic acid, and Vitamin B12 in FRK. The methods are given in the order. This will help to remove any ambiguity in results due to variation in methods.

[Mandatory uploading of the test reports with source of iron in FR, FRK & Vitamin Premix for FRK](#) As per this order, FSSAI notified laboratories approved for testing FR, FRK and premix for the FRK, shall clearly mention the source of iron and upload the reports in InfoLNet immediately after completion of analysis. All the Govt. Food control authorities, professionals, DFPD and FCI shall mention the source of iron while forwarding letter/ sample request form.

[Guidelines on sampling of Fortified Rice Kernels \(FRK\) and Fortified Rice \(FR\)](#) Guidelines for sampling of FR, FRK, approved by scientific panel, is published. These are to be implemented by all the Govt. Food control authorities, professionals. The guidelines are given in the Annexure to the order.

[Operationalisation of Draft FSS \(Food Products Standards and Food Additives\) Amendment Regulations w.r.t. the standards of Vitamin and Mineral Premix for manufacturing of FRK](#) This order sets limits of micronutrients in Vitamin and Mineral premix for FRK. Although the draft notification may take some time, the provisions are decided to be operationalised with immediate effect.

[Revising the option for selecting the validity period during application for FSSAI License/registration](#) This is a modification of the earlier order dated 11th January 2023 regarding instant renewal of license/ registration. The instant renewal of license was only for one year but now can be opted for up to five years. This is a good move by Food authorities in furthering the ease of doing the business.

[Re-operationalisation of FSS \(Health Supplements, Nutraceuticals, Food for Special Dietary Use, Food for Special Medical Purpose and Prebiotic and Probiotic Food\) Regulations, 2022](#) "Food for Special Dietary Use, Food for Special Medical Purpose and Prebiotic and Probiotic Food) Regulations, 2022", was amended permitting additional food additives and enzyme/ proteins in Health Supplement

on 10.05.2022. This amendment has been re operationalized for further three months from October 1, 2023.

[Application fees for Vegan Logo Endorsement](#) Application fees for Vegan logo endorsement has been reduced from Rs. 25000 to Rs. 10000 per product.

[Notice for seeking public comments on recommended Method/Manual by Scientific Panel on Methods of Sampling & Analysis](#) Following two methods viz. 1) [Method for residue analysis of ethylene oxide and 2-Chloroethanol in foods](#) 2) [Manual of methods of analysis of Food Meat and Meat products](#). approved by Scientific panel, are circulated for comments/ views/ suggestions from stakeholders. The comments in prescribed format with scientific evidence should be submitted before 23 December 23..

[Use of Steviol glycoside \(stevia\) in 'cocoa and chocolate products' and 'imitation chocolate'](#) As per FSS (Food Products standards & Food additives) Regulations 2011, Steviol glycoside is not permitted in chocolate and imitation chocolate products but is permitted in many other categories such as Dairy based drinks, Dairy based desserts, etc. As per the order, FBOs



cannot apply for the use of Steviol glycosides in chocolate and imitation chocolate products as a Non specified food/ Food ingredient/ Food additive under FSS (Approval for Non-Specific Food and Food ingredients) Regulations 2017. Use of Steviol glycoside in chocolate and imitation chocolate products shall be decided by the Authority.

[Rectifiable labelling information for imported food consignments](#) To ensure food safety in imported foods, the order has permitted rectification of labels in the custom bonded warehouse by using a non-detachable sticker or other such methods. However, this rectification does not apply to declarations related to batch number, date marking and country of origin. In other words, these three declarations must be present on the original label.

[Revised list of FSSAI notified laboratories for testing of fortificants in Fortified Rice \(FR\), Fortified Rice Kernel \(FRK\) and Vitamin-Mineral Premix for Fortified Rice Kernel](#). This order supersedes the earlier order dated 02 November 23.



RESEARCH IN HEALTH & NUTRITION

Early treatment of child obesity is effective

Science Daily September 17, 2023

The early treatment of obesity in children is effective in both the short and long term, researchers from Karolinska Institutet report in a study published in *The International Journal of Obesity*.

The researchers followed over 170 young children in Sweden who had received treatment for diagnosed obesity. The children were recruited to the randomised controlled study when they were between four and six years old via children's clinics in Region Stockholm. The children and their parents were randomly assigned to one of three treatment conditions: standard treatment, parental support group, or parental support group with follow-up telephone support. The children and parents in the standard treatment group had meetings focusing on diet and exercise with a doctor, paediatrician and/or dietician.

The two parental support groups did not involve the children and focused on how the parents could promote healthy lifestyles in the family in a positive way and without

conflict. "Such conversations can centre on how to set boundaries, how to teach children new behaviours and how to communicate with preschools, grandmothers, neighbours and other adults in the children's world," says principal investigator Paulina Nowicka, Associate Professor in Pediatric Science at the Department of Clinical Science, Intervention and Technology, Karolinska Institutet, and professor of Food studies, nutrition and dietetics at Uppsala University.

After attending the parental support groups, half of the participants were then randomly assigned a follow-up phone call. Studies have been done on children who have been treated for obesity before," says Professor Nowicka. "But most of them have only been followed up after six months or a year, so we have no data on how the children fared over a longer period than that."

The study that she and her colleagues have now published suggest that early obesity treatment has a lasting effect. "The children in all three groups improved their weight status and saw a reduction in their degree of obesity," she says. "The children

whose parents received parental support had the best results, especially so those who also received follow-up phone calls. We also found that more children in this third group showed a clinically relevant improvement of their weight status associated with better metabolic health, by which I mean better levels of blood lipids and glucose."

According to Professor Nowicka, most parents know what kind of food they are to serve their children: "They usually know this -- but what do you do with a child who loves food and always wants to eat, or one that's always hungry? How do you go about it without making a taboo of food?" she says. "You have to try to build a clear structure at home, one that makes the child know that lunch is on its way and know that they'll be getting supper."

She continues: "But you also need to do things together to strengthen family bonds, like getting the child involved in the cooking, giving the child vegetables if they're hungry and not rewarding them with food. It's also important to make sure that food isn't associated with emotions and achievement."



New research adds evidence to the benefits of ginger supplements for treating autoimmune diseases

Study looked at the impact of ginger supplements on people's white blood cell function

Science Daily September 22, 2023

The research published today in JCI Insight focused on studying the impact of ginger supplementation on a type of white blood cell called the neutrophil.

The study was especially interested in neutrophil extracellular trap (NET) formation, also known as NETosis, and what it may mean for controlling inflammation. The study found ginger consumption by healthy individuals makes their neutrophils more resistant to NETosis.

This is important because NETs are microscopic spider web-like structures that propel inflammation and clotting, which contribute to many autoimmune diseases, including lupus, antiphospholipid syndrome and rheumatoid arthritis.

"There are a lot of diseases where neutrophils are abnormally overactive. We found that ginger can help to restrain NETosis, and this is important because it is a

natural supplement that may be helpful to treat inflammation and symptoms for people with several different autoimmune diseases," said senior co-author Kristen Demoruelle, MD, PhD, associate professor of medicine at the University of Colorado School of Medicine on the University of Colorado Anschutz Medical Campus.

In a clinical trial, the researchers found that daily intake of a ginger supplement for seven days (20 mg of gingerols/day) by healthy volunteers boosted a chemical inside the neutrophil called cAMP. These high levels of cAMP then inhibited NETosis in response to various disease-relevant stimuli.

"Our research, for the first time, provides evidence for the biological mechanism that underlies ginger's apparent anti-inflammatory properties in people," said senior co-author Jason Knight, MD, PhD, associate professor in the Division of Rheumatology at the University of Michigan. The researchers say that many people with inflammatory conditions are likely to ask their health care providers whether natural supplements could be helpful for them or they already take supplements, like ginger, to help manage symptoms. Unfortunately the precise impact on disease is often unknown.

Being a vegetarian may be partly in your genes
Large study found three genes strongly linked to vegetarianism

Science Daily October 4, 2023

The findings open the door to further studies that could have important implications regarding dietary recommendations and the production of meat substitutes.

"Are all humans capable of subsisting long term on a strict vegetarian diet? This is a question that has not been seriously studied," said corresponding study author Dr Nabeel Yaseen, professor emeritus of pathology at Northwestern University Feinberg School of Medicine. A large proportion (about 48 to 64%) of self-identified "vegetarians" report eating fish, poultry and/or red meat, which Yaseen said suggests environmental or biological constraints override the desire to adhere to a vegetarian diet. "It seems there are more people who would like to be vegetarian than actually are, and we think it's because there is something hard-wired here that people may be missing."

To determine whether genetics contribute to one's ability to adhere to a vegetarian diet, the scientists compared UK Biobank genetic data from 5,324 strict vegetarians (consuming no fish, poultry or red meat) to 329,455 controls. All study participants were white Caucasian to attain a homogeneous sample and avoid confounding by ethnicity.



The study identified three genes that are significantly associated with vegetarianism and another 31 genes that are

potentially associated. Several of these genes, including two of the top three (NPC1 and RMC1), are involved in lipid (fat) metabolism and/or brain function, the study found. "One area in which plant products differ from meat is complex lipids," Yaseen said.

"My speculation is there may be lipid component(s) present in meat that some people need. And maybe people whose genetics favour vegetarianism are able to synthesize these components endogenously. However, at this time, this is mere speculation and much more work needs to be done to understand the physiology of vegetarianism."

"While religious and moral considerations certainly play a major role in the motivation to adopt a vegetarian diet, our data suggest that the ability to adhere to such a diet is constrained by genetics," Yaseen said. "We hope that future studies will lead to a better understanding of the physiologic differences between vegetarians and non-vegetarians, thus enabling us to provide personalized dietary recommendations and to produce better meat substitutes."



Resistant starch supplement reduces liver triglycerides in people with fatty liver disease

Science Daily
September 5, 2023

Resistant starch is a nondigestible fibre that ferments in the large intestine, and consumption of it has previously been shown to have a positive effect on metabolism in animal studies.

Now, a 4-month randomized controlled trial in people with non-alcoholic fatty liver disease (NAFLD) indicates that daily intake of resistant starch can alter gut bacteria composition and lower liver triglycerides and liver enzymes associated with liver injury and inflammation. This research appears in the journal *Cell Metabolism* on September 5.

NAFLD, caused by a buildup of fat in the liver, affects about 30% of the population worldwide. It can lead to severe liver diseases and contribute to other conditions, such as type 2 diabetes and cardiovascular disease. Currently, there is no approved medicine available to treat NAFLD. Doctors usually recommend dietary changes and exercise to alleviate the conditions.

"We think it would be very meaningful if we can find an effective approach, maybe

through identifying new therapeutic targets, to manage NAFLD," says Huating Li, the paper's co-corresponding author at Shanghai Sixth People's Hospital. Previous research has suggested that NAFLD is associated with perturbed gut microbiota. For example, people with early-stage NAFLD already have an altered gut bacteria profile.

So, Li and her team wanted to investigate if resistant starch - a type of fibre known to encourage the growth of beneficial gut bacteria -- can help treat NAFLD. The team recruited 200 NAFLD patients and provided them with a balanced dietary plan designed by a nutritionist. Among them, 100 patients also received a resistant starch powder derived from maize while the other 100 received calorie-matched non-resistant corn starch as a control. They were instructed to drink 20 grams of the starch mixed with 300 mL water (1 ¼ cups) before meals twice a day for 4 months. After the 4-month experiment, participants who received the resistant starch treatment had nearly 40% lower liver triglyceride levels compared to patients in the control group. In addition, patients who had the resistant starch treatment also saw reductions in liver enzymes and inflammatory factors associated with NAFLD.





Calorie restriction in humans builds strong muscle and stimulates healthy aging genes

Science Daily October 13, 2023

Reducing overall calorie intake may rejuvenate your muscles and activate biological pathways important for good health, according to researchers at the National Institutes of Health and their colleagues.

Decreasing calories without depriving the body of essential vitamins and minerals, known as calorie restriction, has long been known to delay the progression of age-related diseases in animal models. This new study, published in *Aging Cell*, suggests the same biological mechanisms may also apply to humans.

Researchers analysed data from participants in the Comprehensive Assessment of Long-Term Effects of Reducing Intake of Energy (CALERIE), a study supported by the National Institute on Aging (NIA) that examined whether moderate calorie restriction conveys the same health benefits seen in animal studies. They found that during a two-year span, the goal for participants was to reduce their daily caloric intake by 25%, but the highest the group was able to reach was a 12% reduction.

Even so, this slight reduction in calories was enough to activate most of the biological pathways that are important in healthy aging. "A 12% reduction in calorie intake is very modest," said corresponding author and NIA Scientific Director Luigi Ferrucci, M.D., Ph.D. "This kind of small reduction in calorie intake is doable and may make a big difference in your health."

The research team next sought to understand the molecular underpinnings of the benefits seen in limited, previous research of calorie restriction in humans. One study showed that individuals on calorie restriction lost muscle mass and an average of 20 pounds of weight over the first year and maintained their weight for the second year. However, despite losing muscle mass, calorie restriction participants did not lose muscle strength, indicating calorie restriction improved the amount of force generated by each unit of muscle mass, called muscle specific force.

A lower caloric intake upregulated genes responsible for energy generation and metabolism, and downregulated inflammatory genes leading to lower inflammation. "Since inflammation and aging are strongly coupled, calorie restriction represents a powerful approach to preventing the pro-inflammatory state that is developed by many older people," said Ferrucci.



Omega-3 discovery moves us closer to 'precision nutrition' for better health

Science Daily October 11, 2023

University of Virginia School of Medicine researchers have obtained new insights into how genes influence their ability to use Omega-3 and Omega-6 fatty acids for good health. The findings are an important step toward "precision nutrition" -- where a diet tailored to exactly what our bodies need can help us live longer, healthier lives.

Omega-3 and Omega-6 are "healthy fats." We can get them from foods, but many people also take them as supplements. Omega-3 helps keep the immune system healthy and may lower the risk of heart disease, while Omega-6 promotes immune health and offers other benefits. These fatty acids also play important roles in the proper functioning of our cells.

People with higher levels of the fatty acids circulating in their bloodstreams are thought to be at reduced risk of heart disease, type 2 diabetes, Alzheimer's disease, breast cancer and other serious illnesses. There has been substantial research into how genes influence the body's ability to use Omega-3 and Omega-6 among people of European descent,



but there has been much less study among Americans of Hispanic and African descent.

The new findings reveal broad similarities among the groups but also some important differences that highlight the need to conduct genetic studies in diverse groups of people. "People of diverse ancestries have some distinct features in their DNA, and we can find this genetic variation if we include diverse participants in research," said Manichaikul, of UVA's Center for Public Health Genomics and Department of Public Health Sciences. "The results from this study bring us a step closer to considering a full spectrum of genetic variation to predict which individuals are at increased risk of fatty acid deficiencies."

To better understand these genetic differences, Manichaikul and colleagues looked at data collected from more than 1,400 Hispanic-Americans and more than 2,200 African-Americans. This data was obtained through the Cohorts for Heart and Aging Research in Genomic Epidemiology (CHARGE) consortium, an international group created to facilitate large-scale genetic analyses. The researchers say their new findings lay the groundwork for future studies to examine how fatty-acid differences may influence the outcomes of diseases such as cancer, or how they affect immune system function.

We might then use "precision nutrition" -- a carefully tailored diet or strategic supplementation -- to improve those outcomes.

Jet lag disorder associated with shift work can lead to brain changes increasing appetite

Science Daily October 11, 2023

Scientists have uncovered why night shift work is associated with changes in appetite in a new University of Bristol-led study. The findings, published in *Communications Biology*, could help the millions of people that work through the night and struggle with weight gain.

Scientists from Bristol and the University of Occupational and Environmental Health in Japan, sought to understand how 'circadian misalignment' -- a phenomenon commonly associated with 'jet-lag' whereby the body's biological clock is disrupted -- affects the hormones responsible for regulating appetite. Prevalent in night shift workers, in this new study, the international team reveal how circadian misalignment can profoundly alter the brain's regulation of hormones controlling hunger to the detriment of metabolic health.

The team focused on glucocorticoid hormones in the adrenal gland which regulate many physiological functions including metabolism and appetite. Glucocorticoids are known to directly regulate a group of brain peptides



controlling appetitive behaviour, with some increasing appetite (orexigenic) and some decreasing appetite (anorexigenic).

In an experiment using animal models, comprising a control group and an out-of-phase 'jet-lagged' group, the team found misalignment between light and dark cues led the out-of-phase group's orexigenic hypothalamic neuropeptides (NPY) to become dysregulated, driving an increased desire to eat significantly more during the inactive phase of the day.

Strikingly, the team discovered that rats in the control group ate 88.4% of their daily intake during their active phase, and only 11.6% during their inactive phase. In contrast, the 'jet-lagged' group consumed 53.8% of their daily calories during their inactive phase (without an increase in activity during this time). This equated to nearly five-times more (460% more) than what the control group consumed during the inactive phase. These results show that it is timing of consumption that has been affected.

This new discovery revealed how completely, and significantly, disordered the neuropeptides become when daily glucocorticoid levels are out of synch with light and dark cues.

Omega watch: Researchers develop new blood test for measuring levels of critical omega-3 fatty acids

Science Daily October 12, 2023

Researchers at McMaster and the University of Guelph have discovered a convenient new way to track levels of omega-3 fatty acids in the bloodstream, making it much easier to access information that is critical to cardiovascular and cognitive health, but which has previously been challenging to gather.

While the human body can generate most of the fats it needs, it cannot produce adequate levels of omega-3 fatty acids and must obtain them from dietary sources. Two key omega-3 fatty acids, called EPA (eicosatetraenoic acid), and DHA (docosahexaenoic acid), can be derived only from certain sources, such as fish, seafood, enriched foods, and supplements, but measuring how much gets into the blood has been both difficult and invasive.

In addition to increasing the risk of cardiovascular events, a lack of omega-3 fatty acids has also been associated with inflammation and other health conditions, including cognitive impairment, depression, fetal neurodevelopment, and premature birth. The newly discovered biomarkers of the Omega-3 Index (O3I) will make it easier for researchers to study omega-3 fatty acid nutrition in support of population health, including

vulnerable groups.

"This reflects that you are what you eat. Omega-3 fatty acids are primarily derived from our diet and are incorporated into the membranes of all cells and tissues in your body," says Philip Britz-McKibbin, lead author of the study and a professor of chemistry and chemical biology at McMaster University. "The body's response to omega-3 supplementation can vary significantly between individuals, with distinct health benefits reported for patients who consumed only EPA, only DHA, or a mixture," says Britz-McKibbin.

Existing tests to measure the Omega-3 Index have required drawing large volumes of blood and complicated laboratory work to analyse their omega-3 fatty acid content. As a result, most clinicians do not routinely measure O3I. The new method opens the door to regular screening, which can help clinicians and patients understand how much supplementation is necessary.

"Testing for the O3I is a complicated procedure so it's not routinely available for patient screening, despite the popular use of fish oil supplements, and promising clinical evidence of the many health benefits from optimal omega-3 fatty acid nutrition," says Britz-McKibbin. "This should make it much more convenient to do routine testing since dosage levels and product formulations differ widely in their exact omega-3 fatty acid composition."



The study has been published in the Journal of Lipid Research and co-authored by Stuart Phillips, a professor of kinesiology at McMaster and David Mutch, a professor of human health and nutrition at the University of Guelph. Participants in the study were given between 3 and 5 grams of fish oil, EPA or DHA supplements per day. Researchers performed lipid profiling to isolate specific O3I biomarkers from among hundreds of detectable circulating lipids.

"Our test can be part of a routine blood test without any special requirements," says Britz-McKibbin. "By directly measuring only two specific biomarkers in a blood sample, we can rapidly assess the O3I without time-consuming and costly sample workup protocols prior to analysis."

Turmeric compound equal to pharma counterpart in soothing indigestion

13 Sep 2023 Nutrition Insight

Curcumin, the main bioactive compound in turmeric,



has an equivalent efficacy to omeprazole for indigestion or functional dyspepsia with no synergistic effect, according to researchers from Chulalongkorn University Faculty of Medicine in Thailand. Their findings suggest the ingredient be considered for use in clinical practice.

“Thai traditional medicine doctors have been using curcumin for this purpose for decades. The relatively low dose of curcumin might be prepared and consumed as a first-line self-care by laypersons in a household before seeking medical attention if not improved,” Krit Pongpirul, associate professor in the department of preventive and social medicine at Chulalongkorn University Faculty of Medicine, tells Nutrition Insight.

“Formulating a new OTC dosage form that focuses on function dyspepsia would definitely create a new market segment. The natural form that contains a low dose of curcumin would have a relatively lower manufacturing cost compared to the currently available dietary supplement with a high dose of curcuminoid extracts,” Pongpirul explains.

Turmeric is derived from the root of the *Curcuma longa* plant. Its naturally active compound, curcumin, has anti-inflammatory and antimicrobial properties and has long been used as a medicinal remedy in Southeast Asia for treating indigestion. The current study, published in the BMJ Evidence-Based

Medicine journal, found that curcumin is equally effective as the pharmaceutical omeprazole, a drug used to curb excess stomach acid and treat indigestion symptoms.

Omeprazole is a proton pump inhibitor clinically used to treat functional dyspepsia, including symptoms such as feeling excessively full after eating, early satiety and stomach pain. However, its long-term use has been linked to increased fracture risk, micronutrient deficiencies and a heightened risk of infections, the researchers indicate.

“Comparing the side effect profiles of curcumin and omeprazole is a bit complex because they are used for different purposes and have different mechanisms of action in the body,” notes Pongpirul.

“Curcumin is generally considered safe when consumed in the amounts typically found in food. The 2 g of ground curcumin powder capsule used in this study is relatively low, compared to the extracts commonly found in curcumin supplements, and, therefore, has fewer side effects,” he says.

The current study randomly assigned 206 patients aged 18 to 70 with recurrent upset stomachs to one of three treatment groups for 28 days. Two large 250 mg capsules of curcumin and one small dummy capsule were administered four times a day to 69 patients. One small 20 mg capsule daily and two large dummy capsules four times a day were given to 69 patients, while turmeric plus omeprazole was administered

to 69 patients.

“The study simply used ground powder of natural turmeric that contains a relatively lower dose of curcuminoids than that of dietary supplements for anti-inflammatory or anti-bacterial purposes,” says Pongpirul. Severity of Dyspepsia Assessment scores (SODA) show reductions in symptom severity by day 28. SODA also captures satisfaction scores, which hardly changed over time among the curcumin users, which could be related to its taste or smell. No severe side effects were reported.

By Inga de Jong

The power of food literacy: FSA program spurs healthier eating habits in adults

12 Sep 2023 Nutrition Insight

Food literacy programs can improve diet quality and reduce the risk of developing noncommunicable diet-related diseases in adults, according to a recent study.

The quasi-experimental study evaluated the effectiveness of the Food Sensations for Adults (FSA) program. Data collection occurred before and after the four-week program, with a control group recruited from adult volunteers and staff at a foodbank warehouse in Perth, Australia, as well as from a public exposition event.





Despite its relatively short duration, the researchers found that the FSA program demonstrated remarkable effectiveness in fostering a sustained behavioural change, aligning with findings from similar programs. "Behaviour change takes time to establish," says Dr Andrea Begley, lead author of the study. "Participants may be unable to change all food literacy and dietary behaviours quickly, so unsurprisingly, programs lasting more than five months were deemed the most effective."

The study included 128 control group participants who completed the pre-program questionnaire and 80 who completed the post-program questionnaire, and this data was compared with responses from FSA program participants. According to the researchers, notable improvements were observed in the matched control group. Meal planning and management improved by an average of 12.4% and consumption of vegetables increased by 22.6%, or about 0.5 servings per meal. Fruit consumption also increased to between 0.3 to 1.6 cups daily.

The control group participants also reported enhanced cooking confidence and a 5.7% increase in their confidence regarding selecting the proper foods. "This study underscores the value of food literacy initiatives like the FSA program in positively influencing

dietary habits and enhancing overall food literacy, ultimately contributing to better health outcomes and a reduced risk of chronic diseases among adult participants," Begley remarks.

The FSA program consists of four 150-minute sessions. Each session begins with interactive nutrition education activities, covering topics like dietary guidelines, portion control and meal planning. The fourth session allows participants to choose a topic. After the educational component, participants develop hands-on cooking and food safety skills, followed by tasting and sharing the prepared food.

Furthermore, the program emphasizes incorporating vegetables into meals and snacks.

Additionally, the researchers highlight that the FSA program was designed based on food literacy models and behaviour change theories. It is delivered both in-person and online. The program's designers utilize adaptations for web delivery with the aim of being accessible to those with low literacy levels - primarily using pictorial resources.

Edited by William Bradford Nichols

AI-enhanced personalized nutrition: Verdify's Noory platform customizes food intake for dietary goals

04 Sep 2023 Nutrition Insight

A new digital nutrition guide tailors daily meals to a person's individual preferences and dietary

requirements, specifically designed for people with weight management goals, food allergies and digestive issues.

Foodtech start-up Verdify, says consumers can join the free platform - dubbed Noory - online, where they create a personal profile. The platform assesses nutritional needs, optimizes food intake, creates personalized meal plans and helps to monitor progress. Verdify notes that it can also complement the advice of dietitians, as these often have limited capacity to create extensive meal plans for each patient.

"Verdify's mission is enabling people to make better food choices for personal and planetary health. With Noory, Verdify aims to create meaningful impact by empowering people to cook healthy meals aligned with personal health needs, regardless of dietary challenges," Fleur Pasman, the company's chief operations officer, tells Nutrition Insight. Verdify aims to provide adequate support to people with personal dietary challenges, enabling them to control their health and well-being better. Noory optimizes recipes through ingredient exchanges and considers nutrition values and taste alignment to ensure that individuals with complex dietary challenges can still enjoy a diverse and varied range of meals.



"Eating healthy might seem an easy and straightforward lifestyle to adopt, but it's not always the case," says Alessia Carrafiello, product and operations manager at Verdify. "What's healthy for you might not be healthy for somebody else due to food allergies, intolerances, health conditions or different lifestyles. Therefore, a one-size-fits-all approach doesn't work."

Users can choose among five nutrition goals: managing food allergies and intolerances, improving gut health, weight management, living a healthier lifestyle or a more sustainable lifestyle. "Unlike traditional meal planning solutions that don't cater to specific dietary needs, Noory will generate meal plans that are carefully checked and optimized to suit someone's needs at no cost," explains Carrafiello.

"Combining the expertise of our nutrition team, national dietary guidelines and AI, Noory takes into account over 15 personal parameters to optimize recipes by automatically swapping ingredients in and out. This makes Noory a great solution for people with specific dietary needs."

By Jolanda van Hal

MFGM marvel: Complex component in human milk linked to long-term cognitive benefits

01 Sep 2023 Nutrition Insight

Known as the "gold standard" in infant nutrition, breast milk is



considered to play an essential role in infant immunity, gut and brain health, yet many families encounter obstacles to breastfeeding.

However, a team of researchers from the University of Kansas is unveiling the results of a study demonstrating that a complex component found in milk fat globule membranes (MFGMs), which can be added to infant formula, has the potential to bestow enduring cognitive advantages on children. "No one thought much about this membrane," says Dr John Colombo, the lead author of the study. "Until chemical analyses showed that it's remarkably complex and full of components that potentially contribute to health and brain development."

Scientists and infant nutrition and formula companies have long endeavoured to create a viable substitute or supplement to breast milk, aiming to provide children with optimal early development. According to the Centers for Disease Control, only 45% of infants in the US remain exclusively breastfed at three months old. According to the researchers, the study, published in the Journal of Pediatrics and conducted in collaboration with Mead Johnson Nutrition and partners in Shanghai, China, bolsters the growing body of scientific evidence supporting the

importance of elements found in MFGMs during early human development.

Moreover, the study reveals that feeding infants with formula enriched with MFGM and lactoferrin for 12 months led to a five-point increase in IQ by the age of 5.5 years. The researchers state that these effects were most pronounced in assessments of children's information processing speed and visual-spatial skills. Additionally, significant differences were observed in children's performance on tests of executive function, which encompass complex skills like rule learning and inhibition. Notably, these advantages persisted in children long after the cessation of formula feeding at 12 months of age, demonstrating the potential long-term impact of such nutritional enhancements.

Edited by William Bradford Nichols

Beyond The Headlines: Choline found important for prenatal nutrition, NIH reveals key to health of premature infants

01 Sep 2023 Nutrition Insight

This week in nutrition news, the European Food Safety Authority (EFSA) named choline as an important nutrient for intrauterine nutrition.





EFSA officially recognized choline as an essential nutrient contributing to normal liver function in fetuses and exclusively breastfed infants. The recognition follows a comprehensive evaluation by EFSA upon Health's claim application. The company stressed that choline's role in cell structure, signalling and lipid metabolism is already well established, but the EFSA's validation is expected to impact public health policies and maternal nutrition recommendations.

The company says that the recognition will likely raise awareness of the importance of choline-rich diets and supplementation for pregnant and lactating women to support optimal development and is commending the EFSA for its rigorous and evidence-based approach.

By William Bradford Nichols

Vitamin K2 validated by ESC for cardiovascular benefits

01 Sep 2023 Nutrition Insight

Clinical substantiation for the cardiovascular benefits for Vitamin K2 in postmenopausal

women is acknowledged by European Society of Cardiology (ESC).

The society provided validation that supplementation with the product protects and improves cardiovascular performance. According to the research, daily supplementation with menaquinone-7 (MK-7 or MenaQ7) improves the elastic properties of vessels and supports healthy blood pressure in women with significant arterial stiffness.

"This abstract strengthens the proof that K2 as MenaQ7 supports healthy cardiovascular function in aging women and can serve as an inexpensive tool for protecting heart health," says professor Leon Schurgers, lead researcher on the post-hoc analysis and chair of the Gnosis vitamin K2 scientific advisory committee.

Meanwhile, the ESC, in collaboration with the University of Oxford, UK, presented staggering figures about the cost of cardiovascular diseases on European health care expenses, estimated at €282 billion (US\$305 billion) for 2021. The cost of general health care and long-term care alone amounts to €155 billion (US\$168 billion).

The secondary post-hoc analysis conducted via Gnosis by Lesaffre's one-year clinical study in healthy men and women found beneficial effects on elastic properties of the vascular system in postmenopausal women who took 180 mcg of MenaQ7 a day. Menaquinone-7 (MK-7) is a cofactor for vitamin K-dependent protein carboxylation. The vitamin K-dependent matrix Gla protein (MGP) is synthesized in the vasculature and inhibits vascular calcification and stiffness.

"The results confirm that hormonal changes affect the vasculature and that postmenopausal women exhibit increased vascular stiffness reflected by functional vascular damage. Further, MK-7 supplementation significantly attenuates arterial stiffness in postmenopausal women, in which women with increased stiffness benefit most on blood pressure," says Schurgers. Arterial stiffness is a measure of cardiovascular function in blood pressure and clinical studies show that improving K2 status improves these measures by elevating overall cardiovascular health in menopausal women.

By Inga de Jong



FOOD SCIENCE & INDUSTRY NEWS

Yogurt may be the next go-to garlic breath remedy

Study finds proteins in particular have strong deodorizing effect

Science Daily September 19, 2023

A new study conducted in a lab -- with follow-up human breath tests being planned -- showed that whole milk plain yogurt prevented almost all of the volatile compounds responsible for garlic's pungent scent from escaping into the air. Researchers tested the garlic deodorizing capacity of yogurt and its individual components of water, fat and protein to see how each stood up to the stink.

Both fat and protein were effective at trapping garlic odours, leading the scientists to suggest high-protein foods may one day be formulated specifically to fight garlic breath. "High protein is a very

hot thing right now -- generally, people want to eat more protein," said senior study author Sheryl Barringer, professor of food science and technology at The Ohio State University. "An unintended side benefit may be a high-protein formulation that could be advertised as a breath deodorizer in addition to its nutritional claims," she said. "I was more excited about the protein's effectiveness because consumer advice to eat a high-fat food is not going to go over well."

After encountering speculation that yogurt might have a deodorizing effect, Barringer and first author Manpreet Kaur, a PhD student in her lab,



decided to check it out. For each treatment experiment, the researchers placed equal

amounts of raw garlic in glass bottles and confirmed the cluster of offending sulphur-based volatiles were released in concentrations that would be detected by the human nose.

They used mass spectrometry to measure levels of the

volatile molecules in gaseous form present before and after each treatment. Results showed that yogurt alone reduced 99% of the major odour-producing raw garlic volatiles. When introduced separately, the fat, water and protein components of yogurt also had a deodorizing effect on raw garlic, but fat and protein performed better than water.

In the case of fat, a higher quantity of butter fat was more effective at deodorization.

The proteins studied included different forms of whey, casein and milk proteins, all of which were effective at deodorizing garlic -- likely because of their ability to trap the volatile molecules before they were emitted into the air. A casein micelle-whey protein complex performed the best.

"We know proteins bind flavour -- a lot of times that's considered a negative, especially if a food with high protein has less flavour. In this case, it could be a positive," Barringer said. Additional experiments involving changing the pH of the yogurt to make it less acidic -- from 4.4 pH to 7 pH -- reduced the yogurt's deodorization effect on the garlic.

Herbs and spices can transform unhealthy foods into nutritious meals

05 Sep 2023 Nutrition Insight

Researchers from Penn State have created a format for effectively replacing high-in fats, sugars and salt foods (HFSS) using herbs and spices.

The team used the National Health and Nutrition Examination Survey national database of the Centers for Disease Control (CDC) to identify about ten of the most popular HFSS foods.

Of these, the main culprits found to be HFSS in the US included meatloaf, chicken pot pie, macaroni and cheese and brownies. Their nutritional findings have been published in the Journal of the Academy of Nutrition and Dietetics.

“Unfortunately, the majority of our salt intake is out of our control. Most of the salt we eat is in the foods we buy, and once it has been added, we cannot take it out. The food industry has been adding salt to our food for many years – it’s a cheap ingredient that is used for a number of reasons, not just taste,” Sonia Pombo, campaign lead at Action on Salt tells Nutrition Insight. “Using herbs and spices will help to add flavour, but it does not replace the other qualities that salt has – namely preservation. But it isn’t



impossible, and in many categories of food it is a feasible option. We recommend companies gradually reduce the salt content of the food they produce, so that consumers do not notice the difference in taste – adding herbs and spices can certainly help with that.”

“Our goal was to see how much we could lower these over-consumed ingredients without affecting the overall properties of the food in terms of mouthfeel and structure, and then add in herbs and spices to improve the flavour,” explains Kristina Petersen, associate professor of nutritional sciences at Penn State. What sparked the need for the study came from improving food products that claim to be healthier than their 1990s counterparts, borne from the “low-fat craze” but are no

better. Back then, many food companies removed saturated fats from their products but merely replaced them with sugars to give

them the desired taste. The resulting products were not healthier and consumers were still overeating saturated fat.

Pombo adds that to many consumers, it seems as though the only way to add flavour to dishes is with a big pinch of salt, but there are many other ways to ensure food is flavoursome. “The use of herbs and spices, as well as

garlic and citrus, are a great way of adding flavour to foods without the need of using salt,” she says. “This is particularly helpful if cooking at home from scratch, where you have more control of what you add to food, and can be a great way of getting creative in the kitchen and exploring new flavours,” explains Pombo. The current study’s recipes included a primary version mimicking a standard formula that contains typical amounts of saturated fat, sugar and salt. The second was a nutritionally improved version in which the excess saturated fat, sugar and salt were removed and the third had the same nutrient profile as the second but contained herbs and spices such as garlic powder, ground mustard seed, cayenne, cumin, rosemary, thyme, cinnamon and vanilla extract. “We know that one of the key barriers to reducing intake of these ingredients is the flavour of the food. If you want people to eat healthy food, it has to taste good. That’s why our finding that participants actually preferred some of the recipes in which much of the saturated fat and salt was replaced with herbs and spices is so important,” Petersen continues.

By Inga de Jong





Researchers discover technique to biofortify pea shoots with B12 using ultrasonic aeroponic technology

28 Sep 2023 Nutrition Insight

An innovation from UK researchers could make it easier for vegans and vegetarians to get enough vitamin B12 in their diet.

Pea shoots, the young leaves of the pea plant, have been biofortified with essential nutrients using a novel technique that involves sound waves and soilless air farming (aeroponics). The scientists highlight that a single serving of these pea shoots could provide as much vitamin B12 as two portions of beef without any animal products.



The primary source of vitamin B12 in diets comes from animal sources. Deficiency of this vitamin can lead to severe and irreversible damage, particularly to the brain and nervous system.

The researchers from the John Innes Centre, UK, LettUs Grow and the Quadram Institute biofortified the peas using ultrasonic aeroponic technology, growing plants without soil.

“Advances in understanding of how plants interact with their environments, including new horticultural technologies such as vertical farms that use aeroponics, provide exciting opportunities to produce crops that are more nutritious, with less environmental impact,” says Professor Antony Dodd, head of cell and developmental biology at the John Innes Centre.

“By combining expertise in plant sciences, human nutrition and horticultural engineering, we are developing new approaches to address nutritional deficiencies at relatively low cost.”

The type of aeroponics used to grow the biofortified pea shoots is unique to LettUs Grow. The novel technique uses sound waves to create a fine spray of water and nutrients for the plants. The sound waves are so high-pitched that humans cannot hear them, but they can break up water into tiny droplets.

The droplets are then sprayed onto the roots of the pea shoots, giving them precisely what they need to grow. By

adjusting the amount and type of nutrients in the spray, the researchers have boosted the levels of B12 in the pea shoots.

By Marc Cervera



Industry points to scientific and technological advances to stand out in crowded immune health market

26 Sep 2023 Nutrition Insight

Industry professionals highlight that the market for immune-supporting nutrition is increasingly competitive and warrants scientific backing to stand out.

Although consumer demand stays strong, people look for high-value and clinically proven ingredients. Nutrition Insight continues its conversation on immune health developments with Chr. Hansen, Ingredients by Nature, Kerry,



TriNutra and Blue California, diving into the growing role of scientific evidence and technology in the sector. Industry professionals highlighted a continued consumer interest in immune-supporting nutrition and demand for immunity-plus ingredients and products.

“A poor immune system is associated with being easily susceptible to day-to-day illnesses, such as catching a cold, by consumers across all the different regions,” Meilissa Hosen, commercial industry manager of human health at Chr. Hansen tells us. “The fact that consumers are not overly confident toward their immune health while seeing a direct link between having a good immune system and overall good health is something that will result in consumers looking to address this over the next couple of years,” she predicts.

Rob Brewster, president of Ingredients by Nature, echoes this trend, noting that consumers continuously use dietary supplements for immune support. “Vitamins, minerals, probiotics, herbal ingredients and antioxidants lead the immune health supplement category. People are also altering their lifestyles to focus on improving gut health, sleep, mindfulness and staying active to improve their immune health.”

Brewster also highlights that technology allows manufacturers to fortify products with dietary supplement ingredients and improve functionality and bioavailability. “Adding a

clinically studied immune health ingredient to a product that a consumer will likely buy is highly appealing and a great to-go market strategy.”

Although consumers are taking a more proactive approach to seeking products that boost health and immunity, Hosen sees they are still sceptical toward nutritional supplements and have concerns regarding their safety and benefits. “Therefore, it is necessary that such immune health ingredients can demonstrate that they will deliver safety, fully researched and evidence-based benefits.”

Adam Baker, science director of human health at Chr. Hansen shares technological advances that help build an understanding of some complex relationships between the microbiome and the immune system, a link the consumers are increasingly aware of. “We can now study the microbiome through sequencing and even transfer one through fecal transplants and see how this affects immune status. We have more sensitive methods for measuring immune responses and we have started to use wearable technology and be able to track new and novel activities and biomarkers that can give us new readings on our health



status.”

Niamh Hunt, senior global marketing manager of immune and joint health, Kerry, tells us that offering innovative, clinically researched ingredients and new delivery formats will keep consumers engaged in this competitive market. “It’s also worth noting that consumers are being more careful with how they spend their money, leading them to actively seek high-value ingredients - for 60%, this means those that are science-backed. Where immune health is concerned, this rises to 78%, while ‘clinically proven’ is the most sought-after claim for more than 80% of consumers. This echoes Kerry’s research, which has found that 79% of consumers research ingredients for themselves.” Hunt urges manufacturers to offer consumers well-researched, scientifically substantiated immune-supporting ingredients.

By Jolanda van Hal





High-fibre foods: Researchers highlight nutritional quality of climate-resilient sorghum bran

18 Sep 2023 Nutrition Insight

Sorghum bran has higher levels of essential amino acids and minerals needed for human health and development than whole grain or dehulled sorghum flour, find researchers from the University of Johannesburg.

The bran also contained higher levels of crude protein, fat and fibre than whole and dehulled grain. Compared to whole or dehulled grains, sorghum bran is higher in calcium, zinc and potassium. The gluten-free grain contains similar protein, crude fibre, carbohydrates and minerals found in corn, wheat, rice, barley and oats.

After identifying the nutritional quality and functional properties of white and brown sorghum, the researchers suggest that sorghum (*Sorghum bicolor*) bran has significant potential in the food industry and could serve as a nutritionally rich food ingredient. "We believe that this study will have an impact on the food industry, especially toward whole grains for food product development

and the use of sorghum bran as an ingredient in the development of high-fibre foods," the study's lead author, Dr Janet Adebo, a researcher at the

Food Evolution Research Laboratory of the University of Johannesburg, tells Nutrition Insight.

In response to the study, Monia Caramma, sustainable food researcher and steering committee member of the branch organization Sorghum ID tells us the grain has characteristics "that are currently not exploited due to the lack of knowledge of this cereal by processing companies. The application of a by-product that allows the optimization of production processes in the sustainable logic of the fight against waste. Bran is an essential food in the health market, and sorghum bran could improve the quality of gluten-free products as an essential fibre component."

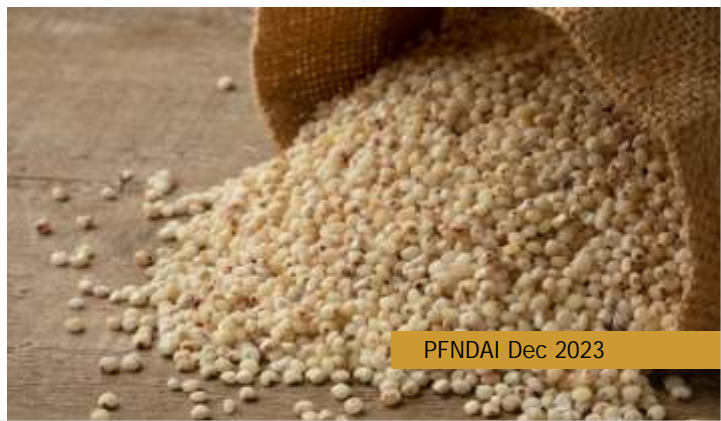
Adebo notes that reducing nutrients in sorghum bran has become a matter of nutritional concern.

She explains that bran removal, or reduction in bran particle size due to milling or deliberate dehulling, affects the nutritional quality. Regular whole grain consumption is linked to various health benefits in scientific studies, which, Adebo posits,

is mostly associated with the bran component included in whole grain.

She details: "According to existing literature, sorghum is known for its health benefits, including its role in easing obesity and diabetes and reducing oxidative stress. Likewise, sorghum is gluten-free; thus, subsequent products are good for those with celiac disease. Some studies have shown pigmented sorghum (such as red or brown) to be versatile and to contain more health-promoting properties. Nutritional content seems to vary across varieties, but perhaps the red/brown could be a better option due to the additional health benefits."

The current study, published in *Heliyon*, found higher crude fibre in the bran than other parts of the whole bran, at +278% for white sorghum bran and +203% for brown sorghum bran, compared to the entire grain. The bran also contains essential amino acids, such as leucine - 1.6 g per 100 g in brown sorghum and 1.2 g per 100 g in white sorghum - and valine - 0.8 g per 100 g in brown sorghum and 0.69 g per 100 g in white sorghum. Leucine and valine support repairing and building muscle tissue, while valine is also crucial in growth hormone production.



Moreover, the researchers found relatively high calcium and magnesium levels in sorghum bran, which they note can assist in bone growth and development.

Sorghum is currently the most important food crop after rice, corn, wheat and barley, and a critical food source for people in Africa and Asia. The grain offers improved yields in arid regions. For example, in South Africa, it is grown in drought-prone areas and is the primary source of nutrients and energy. Adebo explains that sorghum is known to be drought-tolerant and climate-resilient.

Earlier research reported that sorghum is a “substantial contributor to food security in some of the world’s poorest regions, and literature shows that several important variables, including population growth, agricultural inputs, climate change and economic development, influence the production of this crop.”

Sustainable food researcher Caramma explains that sorghum has roots that sink deep, allowing for water savings. “It does not require nitrogenous soil with chemical fertilizers. It is as versatile as corn and can be used in the human food, livestock, biomass and cosmetic industries.”

By Jolanda van Hal



“Consumers abandon” plant-based meat category citing taste, nutrition, price concerns, Mintel finds

By Ryan Daily 08-Aug-2023 - Food Navigator USA

Between recent acquisition and slumping unit sales, the plant-based meat alternative (PBMA) market faces headwinds as consumers shift to less expensive proteins in the face of economic pressure, though all might not be lost for the category, Mintel shared in its Plant-Based Protein executive summary.

“PBMA sales have slid from their peak in 2020 as consumers abandon the category in favour of less expensive protein options. The category continues to struggle with negative perceptions even among those who follow a reduced meat diet,” Caleb Bryant, associate director of food and drink reports at Mintel shared. “Yet silver linings still exist, the frozen PBMA category remains relatively resilient and new product innovation may expand the market by bringing PBMA into new consumption occasions. Brands must address consumers’ concerns around product taste, nutrition, and price in order to achieve real market growth.”

PBMA total sales are estimated to be worth \$1.46bn for 2023 and forecasted to reach \$1.801bn in 2028, with a worst-case prediction of \$995m and \$2.6bn for a best-



case prediction, according to CircanaInfoScan Reviews and Mintel data. Budget-conscious consumer also is less likely to take risks in shopping. Only 20% of consumers followed a reduced meat diet in 2023, with 53% of consumers claiming inflation makes them less likely to try new foods, such as plant-based options, Mintel found.

When it comes to dietary preferences, consumers are less likely to say that they are flexitarians, vegetarians, or vegans, based on Kantar Profiles and Mintel data. In 2023, 8% of consumers said they were flexitarians, 4% were vegetarians, and 2% were vegan, as opposed to 10%, 5%, and 4%, respectively, in 2022. Additionally, consumers who stated that they ascribe to a reduced meat diet dropped to 18% in 2023 from 21% last year.

In a select all-that-apply questionnaire of over 1,400 adults, Mintel found 48% of total consumers said taste and flavour were major concerns, 35% said meat was a better source of nutrition, and 34% said that they were too expensive. Rounding out the top five reasons, 24% of consumers also cited texture concerns, and 21% said that the products are too processed.



While refrigerated products were the largest percentage of launches in 2021, frozen and shelf-stable products have increased. In 2022, 51% of product launches were frozen, 29% chilled, and 20% shelf-stable, compared to 40% frozen, 56% chilled, and 4% shelf-stable in 2021.

Refrigerated products have not met consumers' expectations and can only support a few brands, so CPG brands should focus on frozen products and shelf-stable products, which will help PBMA expand into the centre of the store, Mintel suggested.

Making plant-based meat alternatives more palatable

EurekaAlert14-AUG-2023

One of the biggest obstacles to the uptake of plant-based alternatives to meat is their very dry and astringent feel when they are eaten.

Scientists, led by Professor Anwesha Sarkar at the University of Leeds, are

revolutionising the sensation of plant proteins, transforming them from a substance that can be experienced as gloopy and dry to one that is juicy and fat like. And the only substance they are adding to the plant proteins is water.

To bring about this change, the scientists created plant protein microgels, through a process called microgellation. Plant proteins - which start off as dry with a rough texture - are placed in water and subjected to heating. This alters the structure of the protein molecules which come



together to form an interconnected network or gel which traps water around the plant proteins. The gel is then homogenised, which breaks the protein network into a microgel made up of tiny particles that cannot be seen with the naked eye. Under pressure, as they would be when they are being eaten,

the microgels ooze water, creating a lubricity akin to that of single cream.

Professor Sarkar said: "What we have done is converted the dry plant protein into a hydrated one, using the plant protein to form a spider-like web that holds the water around the plant protein. This gives the much-needed hydration and juicy feel in the mouth. Plant-based protein microgels can be created without having to use any added chemicals or agents using a technique that is widely available and currently used in the food industry. The key ingredient is water."

The research team, who have published their findings in the scientific journal Nature Communications, say the dryness of plant proteins has been a "...key bottle neck for consumer acceptability". With the breakthrough, the research team hope consumer interest in plant-based proteins will be revitalised, encouraging people to reduce their reliance on animal products for protein intake, a necessary step if global climate change targets are to be met.





REGULATORY NEWS

Country-specific context: India reiterates no-go stance on sweetener use for weight management

By Pearly Neo 30-Aug-2023 - Food Navigator Asia

The Food Safety and Standards Authority India (FSSAI) has stressed that existing local guidelines do not endorse the replacement of sugar with sweeteners for weight loss, while joining calls for more localised research to be conducted on its impacts.

The agency has made this statement in the wake of the World Health Organisation (WHO) guideline earlier this year that made a 'conditional recommendation' against the use of non-sugar sweeteners (NSS) to control body weight or reduce the risk of non-communicable diseases such as diabetes.

"FSSAI has already laid down safety limits for these NSS additives to be used in various

food products," the agency stated via a formal statement, which FoodNavigator-Asia has viewed. "Stricter labelling requirements are in place which [for such food products], requiring due declarations on the food labels along with the names of such sweeteners, whether these have been added either singly or in combination with others. These are thoroughly scrutinised before any NSS are allowed in food products, keeping in view of the Indian scenario, the global regulatory practices & risk assessments carried out by the Joint Expert Committee on Food Additives."

Please note that FSSAI has also not recommended these NSS for weight loss or the maintenance of healthy weight, nor as a means of controlling blood glucose in individuals with diabetes. The NSS in question here include a wide range across both caloric and non-caloric sweeteners (that contain less than 2% of the caloric value of sucrose per equivalent unit of

sweetening capacity) such as stevia, acesulfame potassium, aspartame, saccharins, sucralose and sorbitol.

"The WHO has already highlighted in its report that the guideline is still conditional, and there is still a need for country-specific, meaningful input - FSSAI has taken cognisance and concur that country-specific studies are needed to explore the impact of NSS on metabolic processes as well as its links to other diseases," it said. "In the absence of substantive established evidence on the safety of NSS, FSSAI is retaining the existing limits that have already been laid out in the current standards."

'Conditional' recommendations in this case refer to a lack of certainty regarding the guideline or recommendation being made, with the certainty the findings in this case still ranging from 'low' to 'very low'.



The FSSAI Scientific Panel comprising academic and scientific experts further stressed that local context needs to be in place before any conclusions can be made, particularly when it comes to India which has a very different staple diet from the western context.

“The dietary habits of Indians are entirely different and the WHO document has not made any reference or study conducted on an Asian population, particularly the Indian population,” stated the panel. “In a nutshell, this guideline is still inconclusive and several important factors have not yet been considered [so] no sufficient or substantive data is available to revise existing FSSAI standards. We recommend that this WHO guideline be used to educate and create awareness amongst consumers to consume artificially sweetened products in moderation.”

The local sugar industry body Indian Sugar Mills Association (ISMA) expounded on the importance of more localised research regarding the food safety aspects of NSS versus sugar, as well as the provision of correct science-based information to consumers regarding sugar itself. “For instance, sugar is being attacked blindly regardless of the fact that there has not been any study or research to

back up these attacks, no data or scientific research proving that the elimination of sugar automatically means better health,” ISMA Legal and Taxation Director Bharati Balaji told us. “Anything in excess is going to be bad, including sugar, so we definitely want consumers to take this in moderation but balance this with the right knowledge too. India’s sugar consumption is one of the lowest worldwide and 14% of our population is malnourished, so sugar remains important as an affordable source of energy.”

Moderate sugar consumption still appears to be the way to go in the view of the WHO, especially natural sugars. “Replacing free sugars with NSS does not help with weight control in the long term so consumers need to consider other ways to reduce free sugar intake, such as consuming food with naturally occurring sugars like fruit or unsweetened foods and beverages,” said the organisation. “NSS have no nutritional value [and] results also suggest there may be potential undesirable effects from long-term use [although] the certainty of this is still low.”

Taiwan FDA to set consumption limits on ashwagandha and seven other botanicals

By Tingmin Koe 14-Aug-2023 - Food Navigator Asia

Taiwan’s Food and Drug Administration will be setting consumption limits and usage warnings on ashwagandha and seven other botanicals that are used as food ingredients.

The rules are currently open for public feedback. One of the rules states that the daily consumption of ashwagandha (*Withaniasomnifera*) dried leaves and root extract will be limited at 250mg. The warning statement “unsuitable for use in infants, toddlers, pregnant women, elderly, and people with weak gastric functions” should also be stated on the product labelling. The actives from both ashwagandha leaves and roots should be extracted using water and dried before consumption.

Ashwagandha, also known as Indian ginseng, has been consumed for a variety of uses, including stress relief and mental wellbeing. The other seven botanicals that the Taiwan FDA is regulating include devil’s claw (*Harpagophytum procumbens*), coat buttons (*Tridax procumbens*), noni (*Morindacitrifolia*), *Crassula argentea*, husk from the *Plantago* species, *Cistanchetubulosa*, and sugarcane.



Tea products containing devil's claw are not suitable for pregnant women, as well as those suffering from gastric ulcer, duodenal ulcer, heart palpitations, and gallstones. Consumers should be warned of its side effect, specifically, "stimulating the secretion of stomach acid". It should not be taken with antibiotics, anti-inflammatory medicines, and anti-coagulant medicines as well. The daily consumption coat buttons is limited at three grams and one gram for noni tea. Both products are unsuitable for pregnant and young children.

The consumption of psyllium (*Plantago ovata*) husk, commonly used as a dietary fibre or prebiotic, would be limited at 10.2g daily. The limits will also be applied to the husk of *Plantago asiatica*, *Plantago depressa*, and *Plantago psyllium*. Consumers should be informed to take these products with sufficient amount of water on the product labelling.

India Publishes the Food Safety and Standards (Advertising and Claims) Regulations, 2022

Jul 7, 2023
Selerant Food News By: Ashwanandhini Govindarajan

On July 06, 2023, the Food Safety and Standards Authority of India published an article on the

"Enforcement of the Food Safety and Standards (Advertising and Claims) Second Amendment Regulations, 2022" per the Food Safety Standards Act of 2006.

The document includes the following changes:

- The directions provide a further extension in the enforcement of the regulation;
- The extension is provided for six months;
- Regulation 4 specifies that in case of trademark, brand name or fancy name containing adjectives such as "Natural", "Fresh", "Pure", etc., a disclaimer is mandatory;
- The front pack of the label shall prominently carry the statement 'This is only a brand name or trademark or fancy name and does not represent its true nature';
- To allow the business operators to exhaust the existing inventory of packaging materials.

The enforcement period is valid until December 13, 2023.



Sri Lanka Issues Iodization of Salts Food Regulation 2023

Aug 16, 2023 Selerant Food News By: Rolando Rao

On August 15th, 2023, Sri Lanka's Department of Government Printing published a notification on the "Food (Iodization of Salt) Regulations 2023" per Section 32 of the Food Act, No. 26 of 1980.

"The scientific document summarizes the following key points:

- The regulation provides specifications on the granularity of iodized and non-iodized food-grade salts;
- Establishes standards for the physical, chemical, and heavy metal limits;
- The packaging and labelling instructions have been clearly outlined;
- Certificates of registration for manufacturing, distributions, etc. are provided under various schedules.

All the Food business operators are required to comply with the provisions of the regulations.

The regulation will be effective from January 01st, 2024.





Codex Publishes Standard on Dried or Dehydrated Chilli Pepper and Paprika

Sep 21, 2023 Selerant Food News By: Danica Kostic

On September 20th, 2023, the Codex Alimentarius published standard on "Dried or Dehydrated Chilli Pepper and Paprika CXS 353-2022".

The document entails the following key points:

Dried or dehydrated chilli pepper and paprika shall be in accordance with section 2.1 for direct consumption;

- The products to be used as an ingredient in food processing or for repackaging;
- The chemical and physical requirements of these spices shall comply with Annex 1;
- Labelling of these products shall comply with the General Standard for the Labelling of Pre-packaged Foods (CXS 1-1985) etc.;
- The hygiene standards shall follow the provisions of the General Principles of Food Hygiene (CXC 1-1969), and the Code of Hygienic Practice for Low-Moisture Foods (CXC 75-2015).

The regulation is effective

from September 20th, 2023.

India launches strict standards for high-value whiskey to cut labelling adulteration

By Pearly Neo 19-Sep-2023 - Food Navigator Asia

The Food Safety and Standards Authority of India (FSSAI) has formally launched a new set of strict standards to define high-value whiskey products, in a bid to further cut down alcohol adulteration in the country.

India's alcohol industry is well-known for facing many challenges in terms of food safety and adulteration, even more so since the advent of COVID-19 which saw alcohol counterfeit stopping the list of overall counterfeit cases in India throughout 2020.

Alcohol has consistently ranked within the top five products susceptible to counterfeiting in the Authentication Solution Providers' Association (ASPA) annual State of Counterfeiting in India reports over the past few years, facing major issues ranging from ingredient adulteration to trademark infringement.

In an attempt to target such adulteration more forcefully for premium products within the whiskey sector in particular, FSSAI has published

a set of standards defining high-value whiskeys and the labels that can be attached to these dubbed the Food Safety and Standards (Alcoholic Beverages) First Amendment Regulations 2023.

"These regulations will cover whiskeys made from malt and grain to clarify the definitions of [high-value] single-distillate products," FSSAI CEO Kamala Vardhana Rao said via a formal statement. For single malt whiskey, this must be a distillate obtained from fermented mash that uses malted barley without adding any other grain, which is distilled in pot still only, and produced in a single distillery. For single grain whiskey, this must be a distillate obtained from a fermented mash that uses malted or unmalted grain and produced in a single distillery. Single grain whiskey shall not include single malt whiskey and blended malt whiskey or blended grain whiskey."

The labels attached to these products will not be allowed to use the terms 'single malt whiskey' or 'single grain whiskey' if the product contained in the bottles does not fulfil all of the points included in the FSSAI standards.

These regulations will formally come into enforcement in India starting March 1, 2024.

