



PFNDAI

FOOD, NUTRITION & SAFETY MAGAZINE

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ROLES, EFFICACY

AND **SAFETY** OF

FOOD ADDITIVES

Ankit Sinha, Tulsi Chandak & Dr. Govindarajan R

**ONLY FOOD CAN
SUPPLEMENT THE DIET**

Dr JI Lewis

**WASTE LESS, FEED MORE:
AN ANALYSIS ON IMPACTS
OF FOOD LOSS AND WASTE**

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IN GUT HEALTH**

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**IMPORTANCE & ADVANTAGES
OF INCORPORATING
PROCESSED FOODS IN DIET**

Prof Jagadish Pai

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FOOD MUST BE TASTY & NUTRITIOUS

We eat food that contains nutrients that help children grow and keep everyone healthy. However, food means a lot more to humans than nutrition.

Yes, we drink water when thirsty and eat when we are hungry as body does demand the food for its physiological needs but food has a bigger role for humans. We relate it to joy and happiness and so when we want to show our appreciation or love, we offer food. We celebrate various religious and social events by having food together. Even in grief, we offer food as our respect. In various meetings and gatherings whether formal or not, food is one of the important items. When a person gets promotion, a child gets better grades, and even someone wins an election, we give a delicious food like pedha or sweets in recognition.

Everyone loves tasty food. Even when we are hungry, given a choice, we would go for a tasty, flavourful food. Even animals have this discerning nature. When mothers prepare food, they try to make it as tasty as they could so their family members would eat more and not leave it. Even a hotelier tries to make food more palatable so his customer will appreciate it and come again rather than go elsewhere after disappointment.

There is nothing wrong in making food palatable or "hyper-palatable" as some scientists have coined a new word, if food manufacturer tries to retain the clientele and win some more. This should not be looked upon as a wrongdoing. Not just common people demand tasty food, even prisoners revolt if served unpalatable food.

Food business operator must however

ensure one thing while making very tasty food. The taste should not be a substitute for quality, safety, nutrition and health. Taste should not hide poor quality food. That would be unacceptable.

Very early functions of food processing were preservation and safety, as someone had said, "Eat what you can and can what you can't". Later processors tried to preserve maintaining taste and now with knowledge of nutrients especially those that get affected by processing, newer processes are being developed where food not only remains safe and tasteful for a longer period, but also reduces the losses of nutrients and healthful components.

Processed foods have to be tasty and palatable, otherwise people will not buy them. We should not condemn processed foods because they are tasty. They are not different from any other foods in that unless they are tasty people will not buy and eat them. They should be downgraded on the basis of safety and lack of nutrients.

If people eat excessive food, whether processed or home-cooked, they get obese and contract all kinds of diseases. We should create awareness about excessive food consumption which may lead to non-communicable diseases. HFSS foods, whether processed or home-cooked may cause bigger problems. We may educate consumers through labelling especially of HFSS food products having too much fat, sugar and sodium.

We should continue to enjoy our foods and try to make them as nutritious as possible.

Dr Jagadish Pai,
Editor, PFNDAI

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THE CONSUMER BASE



By
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Former Director, National
Institute of Nutrition (ICMR) Hyderabad,
Chairman - Scientific Advisory Committee &
Hon. Scientific Director, PFNDAI

This is a term that most of the industry are aware of. This could also be called a customer base when it comes to nonfood products.

If we look back into history when a company designed and distributed food for under nourished infants in the West; it was a public health need and a philanthropic intention, commercial interest came in much later.

The consumer of yester years was lean, highly active physically but with a

lower energy, protein and nutrient intake. Many products were designed to meet the needs of such consumers. Higher sugar or saturated fat or total energy as well as protein met the nutritional needs of the consumer. Children had growth faltering and parents were unable to provide the right kind of nutrition largely due to lack of awareness. Both sugar and oil were scarce.

In that kind of a scenario industry developed several products like beverages, breakfast foods, Cookies or biscuits all having a good amount of sugar and /or fat. This appealed to the consumers taste as well as provided the quick energy that was lacking at that

time. Claims of boosting energy, helping kids grow better were acceptable and appreciated by the consumer and even the public at large. Even health professionals recommended them in a prescriptive manner with no ethical issues at all.

Several decades passed with no issues and claims even became legendary and transgenerational. Kids played games guessing the product by the advertisements and label claims.



In a matter of a few decades many things changed in the day-to-day life of a consumer. More disposable income, more comforts, Less physical activity, faster lifestyle, transportation, pleasure loving, hard work shifted to hardly work life. This led to a positive energy balance, excess body fat and all the consequences that we are all aware of.

Simply said- THE CONSUMER BASE CHANGED. The products efficacy is not the same anymore and on the contrary, they may be harming the consumer. If industry persists in similar formulations and similar claims the consumer is likely to be disappointed and with time would lead to a public outcry to eliminate such products or restrict their use through regulatory roadblocks in the interest of public health.

Industry may argue that the products were intended for the benefit of the user and did not contribute to the lifestyle change. Lifestyle

changes are complex multisectoral and multifactorial and is difficult to pinpoint a single component as the causative factor or main cause. One cannot stick to the issue that it is decreased physical, activity that needs to be corrected and not the products.

Over a period landscapes change, dress codes change, priorities and cultural behaviors change and so on. Why this happens or how to rewind to earlier status are questions in futility. Fact is that the CONSUMER BASE has changed. Industry needs to do their bit by developing products to match this change. Staying with earlier formulations is not an option.

Rethinking, redesigning and going back to the drawing board is the only option. Challenging the issues can postpone such actions but will never be the solution. Scientific inconsistency cannot be a reason to justify product formulations, it is public



health data and the trends over time that speak for the change in consumer base. Everyone including the consumer needs to play their part in adapting to the changes and none should wait for the other to make the first move. The change in health of consumers is visible in our own homes among friends and family even if we may deny the scientific data. We cannot look the other way.

It is the moral responsibility for all of us in our respective roles to communicate to the respective managements of industry to introspect and voluntarily withdraw or modify or innovate to meet the present needs of the consumer.



WHEN WAS THE SUPPLY CHAIN LAST CHECKED FOR FOOD SAFETY?



AUTHOR

Dr Joseph I Lewis,
Chairman, Regulatory Affairs,
PFNDAI

On finding ethylene oxide (Eto) a Group 1 carcinogen in spice mixes exported from India, the Centre for Food Safety (CFS), Hong Kong instructed local vendors to stop sales and remove the "affected products". Singapore followed as these may have entered the country.

Its risk communication said 'although there is no immediate risk to consumption of food contaminated with low levels of Eto, long-term exposure may lead to health issues. Nothing was sensational until the news reached India; where an avoidable drama unfolded. When over 400 Indian products in the past 5 years were reportedly "banned" either the news went unreported or after reading we just moved on. This time businesses, trade associations, Spice Board and FSSAI felt compelled to respond. Impacted brand owners avowed adherence to standards and FSSAI called for

nationwide testing of all brands. Both responses were inappropriate.

A risk-based law - like the FSSA- approach to consumer safety is proactive. Collecting and testing samples is reacting to the news, not to an unsafe event - which has already passed. According to the law, when an FBO has "reasons to believe" the food processed, manufactured or distributed is not in compliance... he should immediately withdraw the "food in question" indicating reasons for doing so. The CFS issued a recall for the 'affected products'. Testing all brands in the domestic market that did not contain the 'affected products' or " food in question" was pointless. Second, the law says; " where any food which fails to comply with food safety requirements is "part of a batch, lot or consignment" of food of the same class or description, it shall be "presumed until the contrary is proved", that all the food in that batch, lot or consignment fails to comply with those requirements. Hence confirming the absence of Eto in unrelated batches is misconceived and frustrates the proactive endeavour of regulatory agencies.

Instead, once a serious market failure occurs, the right move is to initiate traceability actions. How did it happen? First, the FSMS plan should have identified Eto as a hazard, knowing its use as a fumigant. Finding the points of ingress into the supply chain is of vital importance otherwise the failure will recur. A few months earlier Eto was found in an Indian export of white pepper powder. This is feedback on the vulnerability of the spice supply chains. Perhaps the Spice Board could be entrusted to audit them. Secondly, does the recordkeeping have enough granularity to link the "affected batch" to ingredient(s) supply sources and their practices? Were any such tests being conducted periodically? There was no evidence offered of its absence. Merely claiming adherence to standards or its level reduced in cooking is meaningless.

The regulatory system and practice need urgent change. The thinking that testing one sample of a batch - while all others escape - keeps consumers safe is a fallacy. Finding harmful substances requires monitoring the supply chain for existing risks and looking for emerging ones. When did we last check the supply chain for these capabilities? Food safety relies on the supply chain - not a product.

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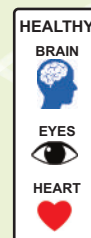
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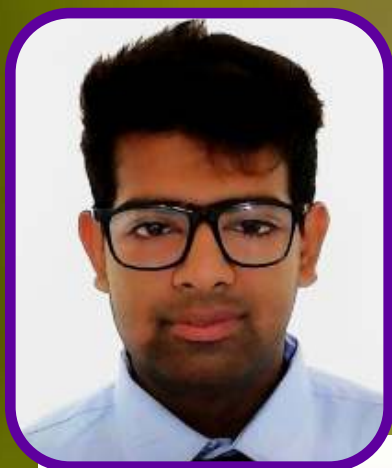
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ROLES, EFFICACY AND SAFETY OF FOOD ADDITIVES

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Introduction

Food Additives has multiple definitions, and can be best described as: "Food Additive is a substance not normally consumed as a food but added to food for a specific technological purpose."

Natural, semisynthetic, or synthetic substances or

products of biotechnology, present in edible products that can be used either directly or indirectly during processing, treatment, packaging, transport, or storage of food for one or more technological purposes, such as prolonging shelf life, sweetening, modifying or stabilizing consistency, enhancing

the purpose of preserving the food and culinary presentation, convenience, or processing efficiency.

Food additives that are used indirectly are compounds that, typically in very small amounts, are added to edible products during manufacturing or packing.

taste, and enhancing or preserving colour [1].

Their use is mostly for

the purpose of preserving the food and culinary presentation, convenience, or processing efficiency.

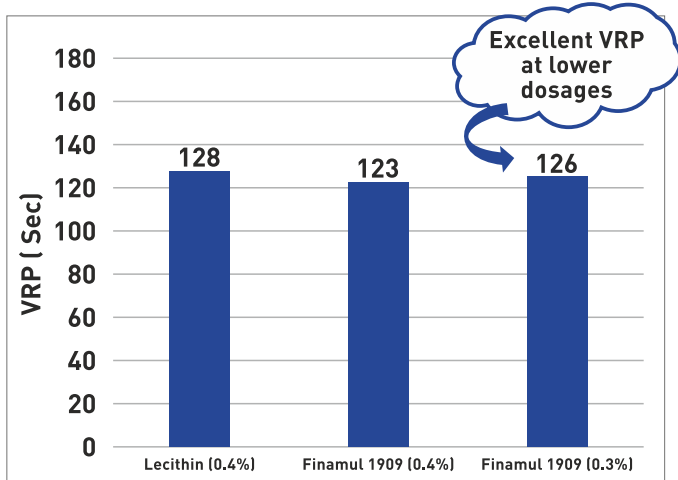
FINAMUL 1909: Safe & Sustainable alternative to Lecithin for Chocolate manufacturers



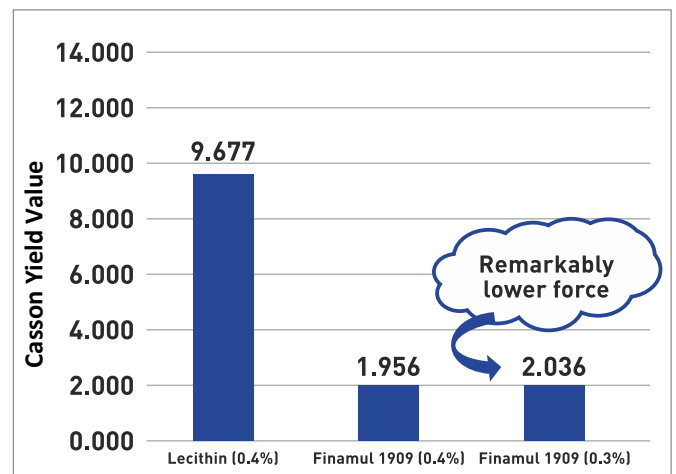
Increasing demand for an allergen-free, Non-GMO and safer consumption approach drives the confectioners to make Finamul 1909 (Ammonium Phosphatide E442) a perfect substitute for Lecithin in their chocolate recipes. Its documented functionality and assured batch-to-batch stability makes it a preferred choice of confectioners over Lecithin. Finamul 1909 has been used by the confectionery industry as an efficient alternative to Lecithin since 1960s.

Finamul 1909 is FINE's specialized grade of Ammonium Phosphatide that is specially designed to help chocolate manufacturers to effectively replace Lecithin to take control over the chocolate's rheology and optimize the flow properties and Casson yield value.

Performance evaluation of Finamul 1909 Vs Lecithin in rheological studies conducted on chocolate formulations at various dosages.



Viscosity reducing power (VRP) attained with Finamul 1909 Vs Lecithin



Force required to initiate the uniform chocolate flow with Finamul 1909 Vs Lecithin

Advantages of Finamul 1909 over Lecithin

Finamul 1909	Lecithin
No adverse effect on flavor even at higher dosage	Imparts off-flavors due to rancidity
Lower Viscosity	Higher Viscosity
Assured batch-to-batch consistency	There may be variation in Chocolate batches produced due to variability quality of lecithin
Offers great microbiological safety and hygiene due to high processing temperatures	Carries Microbiological risk which can be transferred on to chocolates due to low processing temperature
Easy handling - Pumpable at room temperature	Difficult to handle and stick to the bottom of the container
Free from residual oil, Taste & odor	It carries residual oil & beany note
Higher oxidative stability	Lower oxidative Stability

Major applications

- Moulded Chocolates
- Chocolate enrobing/coating
- Chocolate paste
- Chocolate spread

Finamul 1909 can be used in combination with Finamul 2402 (PGPR) and Finamul 6030 (anti-bloom agent) in order to achieve a synergistic effect to optimize the product viscosity and render excellent flow control to your chocolate mass.

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Table 1: Codex Alimentarius Classification in various functional classes.

S. No	Functional Groups	Basic Definition	Examples
1	Acidity regulators	Control the acidity or alkalinity of a food	Citric acid and phosphoric acid
2	Anticaking agents,	Reduce the tendency of food components to adhere to one another	magnesium oxide, silicon dioxide, phosphates and silicates
3	Antifoaming agents,	prevent or reduce foaming	Polydimethylsiloxane, cetostearyl alcohol, Castol oil
4	Antioxidants,	prolong the shelf life of foods	Butylated hydroxyanisole (BHA), butylated hydroxytoluene (BHT), tertbutylehydroquinone (TBHQ)
5	Bleaching agents,	used to decolorize food	Bixin and lycopene (Natural), curcumin, lutein and trans-b- apo-80-carotenal (Synthetic)
6	Bulking agents	contribute to the bulk of a food without having a significant contribution to its available energy value	Guar gum, psyllium husk and modified starch
7	Carbonating agents	provide carbonation in a food	Sodium carbonate
8	Glazing Agents	when applied to the external surface of a food, impart a shiny appearance or provide a protective coating.	Beeswax, candelilla wax, carnauba wax, Microcrystalline wax
9	Colors	Restore color in a food	Natural: Bixin and lycopene Synthetic: curcumin, lutein and trans-b- apo-80-carotenal
10	Emulsifiers	Maintain a uniform emulsion of two or more phases in a food	lecithin, mono- and diglycerides of fatty acids and their esthers
11	Firming agents	Keep tissues of fruits or vegetables firm and crisp or interact with gelling agents to produce or strengthen a gel	Calcium chloride, Aluminum sulfate, aluminum sodium sulfate
12	Flavour enhancers	enhance the existing taste and/or odour of a food	Sodium glutamate, monosodium glutamate
13	Preservatives	additives that prolong the shelf life of foods by protecting against deterioration	Sodium benzoates, potassium sorbates, Sulphur Dioxide etc.
14	Humectants	Prevent foods from drying out by counteracting the effect of a dry atmosphere	sugar alcohols, glycerol, glycerol triacetate, polydextrose, propylene glycol
15	Sweeteners	Alternatives of sugar	Sucralose, stevia, aspartame etc
16	Thickeners	Increase the viscosity of a food	Natural: agar, alginates, carrageenan, carob bean gum, cellulose, guar gum, gum arabic Synthetic: cellulose derivates and chemically modified starches
17	Stabilizers	maintain a uniform dispersion of two or more components	carrageen, alginate, guar gum



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Products

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

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- Pesticide residues, PAH, PCB's
- Mycotoxins
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- Heavy metals and minerals
- Minerals & Toxic heavy metals
- Vitamins
- Antibiotics / Residues
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- Synthetic food colour
- Antioxidants
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Additives as mentioned in the above section can be added intentionally for a specific purpose or may also be formed incidentally because of the processes.

Incidental Food Additives

On the other hand, due to the processes and factors beyond control there are additives that make their way in food incidentally/ accidentally and may have health hazard to the consumer and may also spoil the food as well[4]

These unintentional additives may include components of food-packaging materials, processing aids, pesticide residues, and probably also because of drugs given to animals. Chemically it may be mould growth called mycotoxins, which include the aflatoxins which may find their way into food depending on the external conditions.

Generally, the amount of these contaminants is insignificant and may be considered as negligible, since they may not have any effect on the technicality or functionality of the Product. But when present on excess amount it may cause health hazards even serious outcomes.

International standards for safe use of food

additives

The Codex Alimentarius Commission, a joint inter-governmental agency of the World Health Organisation and the FAO that sets food standards, uses the safety evaluations that JECFA has conducted to determine the maximum amount of additives that can be used in food and beverages. In order to ensure that consumers worldwide may be sure that the food they eat satisfies the established criteria for safety and quality, regardless of where it was produced, Codex standards serve as the benchmark for both national consumer protection regulations and the international food trade. National food rules must be put into place allowing the actual use of food additives once JECFA has determined that they are safe for use and maximum use limits have been set in the Codex General Standard for Food Additives [5].

Safety Evaluation Sequence of Additives

All additives that are approved to be added in the food undergo a thorough safety evaluation before they are allowed to be used. Each country will have its own regulations on additives.

The principal objective of safety evaluation procedure is to identify two groups of

substances: i) those substances whose structure, metabolism, and relevant toxicity data clearly indicate that the substance would be expected to be either safe or otherwise under current conditions of intended use; and ii) those substances which may require additional data in order to perform an adequate safety evaluation. A substance is deemed to be safe if it is excreted as such or metabolised into harmless by products and its intake is less than the threshold for human exposure for that particular structural class. Even though the intake is higher than the human exposure threshold, the chemical is still regarded as safe if it is endogenous or has metabolites that are higher than the threshold [6].



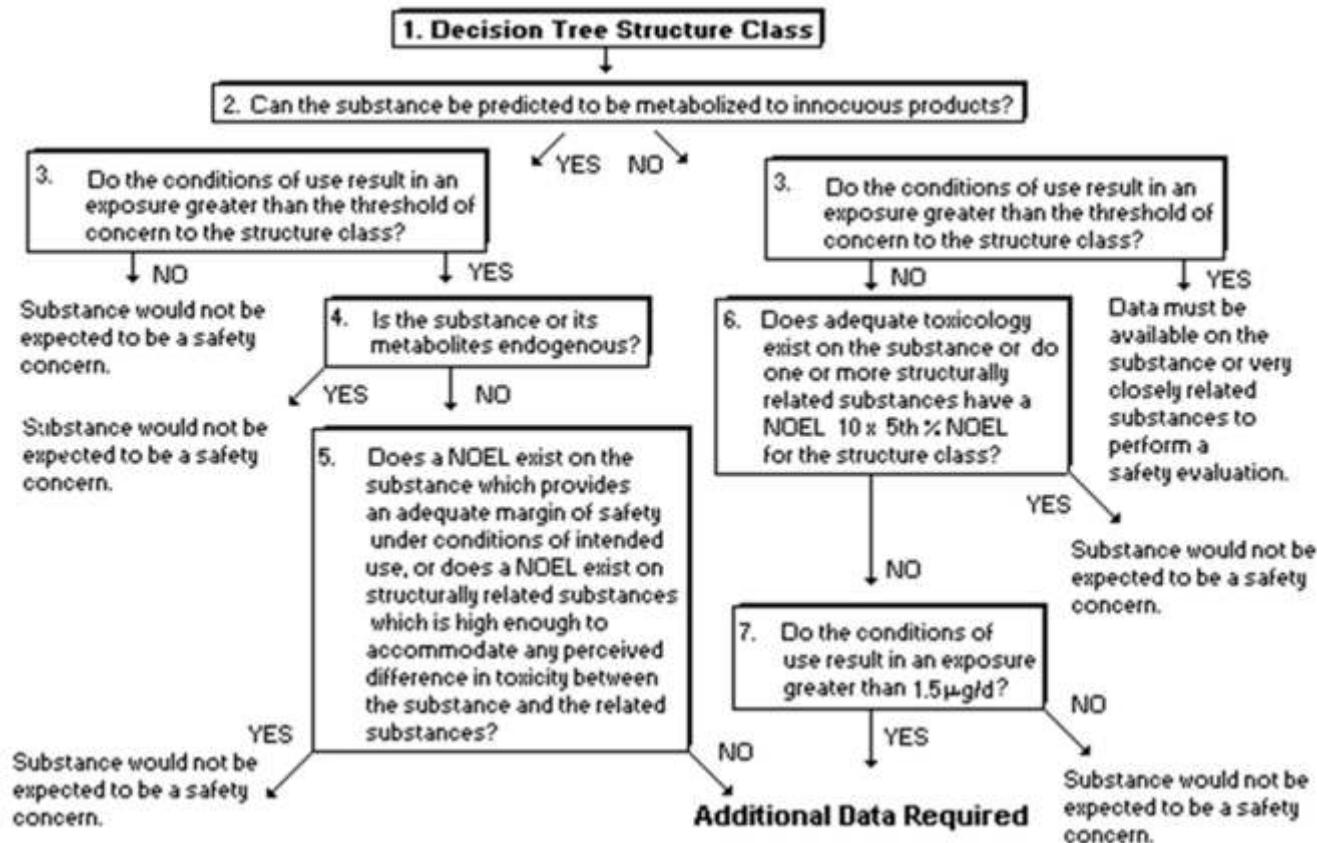


Fig: Safety evaluation sequence[6].

To be deemed safe, a substance or its related substances that are not endogenous must have a NOEL that is noticeably higher than the intake of the substance. To finish the safety evaluation, more data are needed if there are no such data or if the NOEL is not appreciably higher than the substance's consumption.

If metabolic fate cannot be confidently predicted and the intake is greater than the human exposure threshold additional data on metabolic fate or toxicity on the substance or structurally related substances are required to complete the safety evaluation[6]. If the intake is

less than the human exposure threshold, the substance or structurally related substances must have a NOAEL significantly greater than the NOEL for the structure class in order for the substance to be considered safe.

No Observed Adverse Effect Levels (NOAEL)

The NOAEL, expressed as mg per kg body weight per day, is generally based on toxicological effects, but pharmacological effects might occasionally be more appropriate. It depends upon the gradual studies being done with the safety and toxicology. The benchmark dose (BMD) approach can be used to derive a value which can substitute for a NOAEL.

It makes extended use of dose-response data and it provides a quantification of the uncertainty and variability in the dose-response data [7].

Proposal of the Acceptable Daily Intake (ADI)

The ADI (expressed as mg of additive or additive related material per kg body weight per day) is derived by dividing the overall NOAEL (mg/kg body weight) by an appropriate uncertainty factor (generally by 100) and multiplying by a mean human body weight (for example 60 kg)[7].





The setting of an ADI normally requires the similarity of metabolic fate of the active substance in the target animal and laboratory animal.

- An ADI should not be proposed if the substance shows genotoxic or carcinogenic properties relevant to humans.
- An ADI can also be „not specified? because of low toxicity in animal tests.

Global Consumption of Different Food Additives

Technological advancements combined with lack of time has led to the increase in the demand and use of convenience food including chilled, frozen, ready to use and shelf stable, premixes which has made the use of additives like preservatives, emulsifiers, sugar/ sugar substitutes etc inevitable [8]. Therefore, an increase in the global demand for processed food and beverages is fuelling demand for food additives like preservatives, sugar and its substitutes, emulsifiers, food colorants, food flavours, and enhancers, among others. The demand for food additives is expected to increase over the medium term owing to the increasing demand for

them in ultra-processed products[8].

Mechanism of Action

Food Preservatives

Food preservatives are chemicals that stop bacteria from growing and from metabolising in general. At the typical applied concentrations, the final condition at which the microorganisms are killed occurs in a few days or weeks, depending on the type of preservative utilized. The Role of preservatives are not designed to kill microorganisms it involves physical as well as physicochemical mechanisms, especially for the inhibitory action on enzymes. There's a relationship that corresponds to the timescale for the killing of microorganisms under the influence of preservatives[9]:

$$K = 1/t \cdot \ln Z_0/Z_t$$

or

$$Z_t = Z_0 e^{-Kt}$$

where K is the death rate constant, t_1 is the time period, Z_0 is the number of living cells at the time when the preservative begins to act, and Z_t is the number of living cells after time t.

This formula is the base for studying the preservative actions in food. Although it has its drawbacks, This rule

is valid only with relatively high dosage of preservatives.

A significant factor is the partial dissociation of food preservatives with limited lipophilicity. The lipophilic acid molecules that haven't been dissociated can pass freely through the membrane. They go from a low-pH exterior environment into the high-pH cytoplasm. Protons are produced when the acid ionises at a high pH level, acidifying the cytoplasm and dissolving the pH component. The cell then attempts to expel the protons that are entering it in order to preserve the internal pH. By doing this, it takes energy away from processes linked to growth, which causes the cell's yield and growth rate to decline until the cell dies

Emulsifiers

An emulsifying agent is used to maintain homogeneity or uniform dispersion of one liquid in another and give foods a good texture[10].





THAKAAN GONE ENERGY ON



Glucose Based Beverage Mix (14.1.4.3)
(Proprietary Food)



©Creative visualization. Glucon-D does not contain any fruits. Fruits are for creative depiction. ^Contains Glucose. Glucose is an instant source of energy. ™Vitamin C helps support immunity. Glucon-D flavour variants are a rich source of Vitamin C. It contributes to min. 17% of Adult RDA (ICMR-2020) of Vitamin C per serve, when prepared according to the label instruction. Vitamin D helps support immunity. Glucon-D regular is a rich source of Vitamin D₂. Per Serve Vitamin D₂ contribution: 17% of Adult RDA (ICMR-2020). Refer individual pack for more information. ®Registered Trademark.



Emulsifiers prevent coalescence of oil droplets, which promotes the separation of the oil phase from the aqueous phase, as in ice cream or mayonnaise, and allow immiscible liquids, such as water and oils, to mix well without any separation during storage or before use. This results in foods with a good texture and homogeneity.

The basic structure of an emulsifying agent includes a hydrophobic portion of a long-chain fatty acid that attaches to the oil phase, and a hydrophilic portion which may be charged or uncharged and dissolves in the aqueous phase of the liquid. This configuration forms a dispersion of small oil droplets, resulting in a stabilized oil-in-water emulsion [10].

Other benefits:

- Prevent the formation of ice and sugar crystals in foods in case of temperature changes such as in ice cream with sugar.
- used to encapsulate flavour compounds.
- improve volume, fineness and uniformity of processed baked products

Stabilizers and thickeners

Stabilizers and thickeners are used as gelling agents to increase the smoothness, viscosity or consistency of

food products such as in dressings, frozen desserts, confectionaries, pudding mixes, jams and jellies by acting as stabilizing or thickening emulsions. Example: Pectin, Gelatin, Carrageenan, and Gums.

The mechanism of action is by adsorbing to the outer surface of oil droplets thereby increasing the viscosity of the water phase.

Effects of food additives on health

It is very exhaustive and beyond the scope of this article to discuss all the health effects of all the additives, but we have made a small attempt to review some of the important effects of the key additives on health

Health effects of antimicrobials

The gut microbiota is vital for normal development, functioning and priming of the human adaptive immune system. Antibiotic overuse or prolonged usage can have detrimental consequences on the gut microbiota, such as altered metabolic activity, decreased species

diversity, and the selection of organisms resistant to antibiotics [10][11]. This could result in recurring infections.

Antimicrobial agents may disturb the gut microflora of the humans and livestock resulting in increased incidences of infections [12]. Various gut cells are controlled by regulatory mechanisms that counter the effect of inflammatory substances. Any defect in this mechanism can favour the development of chronic intestinal disorders, such as Crohn's disease and ulcerative colitis, the principal forms of inflammatory bowel diseases [10].

Health effects of artificial sweeteners

Concern over excessive intake of sugars and nutritional sweeteners, which are linked to obesity and overweight and increase the risk of metabolic comorbidities such as diabetes, hypertension, high cholesterol, and cardiovascular disease, is growing [13][14][15]



While artificial sweeteners have no nutritive value and will not critically affect blood sugar, some studies have linked saccharin to negative health effects. Studies indicated that it have been found to induce DNA damage in human peripheral lymphocytes. Toxicity symptoms are reported from Ace-k are chronic headache, depression, nausea, mental confusion, liver and kidney malfunctions [15][16][14]. Though it is unfair to blame the entire artificial sweeteners it is important to choose the right one and use within ADI prescribed.

children's behaviour and how they might exacerbate the symptoms of attention deficit/hyperactivity disorder [58].

A few synthetic colourants, such as Fast Green FCF, Erythrosine, Indigo Carmine, Brilliant Blue FCF, and Indigo Carmine, have low absorption but reduced toxicity. Nevertheless, they may trigger an inflammatory reaction in the body, which could activate and disturb the immune system[10].

When compared to the Natural colours as an alternative, are known to be highly unstable under various food processing conditions; hence stabilization of natural pigments is the main challenge to overcome.

Health effects of food flavourings

Excessive use of MSG is not recommended because it may lead to unpleasant physical side effects in some people, including burning, pressure or tightness in the face, and tingling.

Some reported side-effects of MSG are increased sodium in in blood, undesirable for salt sensitive hypertensive individuals and in children, it affects brain



development. Apart from these new observed symptoms, few already stated are: migraines, asthma, fatigue, nausea, dizziness, numbness, heart palpitations, depression, shakes, skin irritation, hyperactivity, brain damage, nervous system damage, obesity and diabetes [18][17].



Health effects of food colourings

Synthetic artificial food colours (AFCs) are added to drinks and snacks for appealing purposes, and the vividly coloured food items that are particularly attractive to the current millennials. Concerns have been raised by research over the past few decades about how artificial food colours (AFCs) affect

References:

- [1] G. A. Blekas, "Food Additives: Classification, Uses and Regulation," in Encyclopedia of Food and Health, Elsevier Inc., 2015, pp. 731-736. doi: 10.1016/B978-0-12-384947-2.00304-4.
- [2] L. Liu and S. Dong, "Food additives," in Food Chemistry, Nova Science Publishers, Inc., 2012, pp. 273-303. doi: 10.5772/34455.
- [3] J. F. Mahoney, "Industry Problems in Developing Intentional Food Additives." Am J Clin Nutr. 1961 May-Jun;9:277-82. doi: 10.1093/ajcn/9.3.277

[4] Functional Classification of Food Additives - e-PG Pathshala (https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/food_technology/food_additives/02.functional_classification_of_food_additives/et/2677_et_m2.pdf)

[5] Codex Alimentarius: General Standard for Food Additives CXS 192-1995 (https://www.fao.org/fao-who-codexalimentarius/sh-proxy/en/?Ink=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcode%252Fstandards%252FCXS%2B192-1995%252FCXS_192e.pdf)

[6] I. C. Munro, "A PROCEDURE FOR THE SAFETY EVALUATION OF FLAVOURING SUBSTANCES." : <https://inchem.org/documents/jecfa/jecmono/v35je21.htm>

[7] "Guidance for establishing the safety of additives for the consumer," EFSA Journal, vol. 10, no. 1. Wiley-Blackwell Publishing Ltd, Jan. 01, 2012. doi: 10.2903/j.efsa.2012.2537.

[8] <https://www.mordorintelligence.com/industry-reports/global-food-additives-market-industry>

[9] M. Surekha and S. M. Reddy, "Preservatives: Classification and Properties," in Encyclopedia of Food Microbiology: Second Edition, Elsevier Inc., 2014, pp. 69-75. doi: 10.1016/B978-0-12-384730-0.00257-3.

[10] M. M. Mwale, "Health Risk of Food Additives: Recent Developments and Trends in the Food Sector." (<https://www.intechopen.com/online-first/85779>)

[11] J. Ramirez, et al., "Antibiotics as Major Disruptors of Gut Microbiota," Frontiers in Cellular and Infection Microbiology, vol. 10. Frontiers Media S.A., Nov. 24, 2020. doi: 10.3389/fcimb.2020.572912.

[12] F. Laudisi, et al., "Impact of food additives on gut homeostasis," Nutrients, vol. 11, no. 10. MDPI AG, Oct. 01, 2019. doi: 10.3390/nu11102334.

[13] N. K. Chaudhary, "FOOD ADDITIVES." <https://doi.org/10.3126/bibechana.v6i0.3935>

[14] Z. Ul-Haq, et al., "Impact of metabolic comorbidity on the



association between body mass index and health-related quality of life: a Scotland-wide cross-sectional study of 5,608 participants," 2012. [Online]. Available: <http://www.scotland.gov.uk/>

[15] K. Krishnasamy, "Artificial Sweeteners." (<https://www.intechopen.com/chapters/72790>)

[16] A. K. Choudhary and Y. Y. Lee, "Neurophysiological symptoms and aspartame: What is the connection?," Nutritional Neuroscience, vol. 21, no. 5. Taylor and Francis Ltd., pp. 306-316, May 28, 2018. doi: 10.1080/1028415X.2017.1288340.

[17] KM Oo, Effects of Food Additives on Human Health. J Myan. Acad. Tech. 19 (1-2), 2019

[18] G. Velázquez-Sámano, et al., "Hypersensitivity reactions to food additives," Rev Alerg Mex, vol. 66, no. 3, pp. 329-339, 2019, doi: 10.29262/ram.v66i3.613



ONLY FOOD CAN SUPPLEMENT THE DIET

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Nothing could have been better for the supplement sector when regulations foster economic growth. The supplements market valued at USD 4 billion (2022) is reported to reach USD 10 billion (2026) at a growth rate of 22%. The sector saw a significant boost during the pandemic with doctor recommendations and consumer buying.

The uptrend driving market behaviour is attributed to health consciousness, increasing disposable income and an expanding middle class. The assurance that regulatory oversight

had finally settled seems premature. Media reports of shifting supplements to the Central Drugs Standard Control Organization (CDSCO) due to regulatory challenges faced by the Food Safety and Standards Authority of India (FSSAI) are now emerging. Concerns are raised that vitamins, minerals, some botanicals and probiotics may also have therapeutic effects and due to unclear demarcation, many companies are shifting from CDSCO to FSSAI for approval of ingredients - akin to drugs - such as melatonin and zinc carnosine (PFNDAI, April 2024). Additionally, marketing supplements in small dosage forms also used in medicines is a concern. Unknown to stakeholders is whether

shifting is the only way to resolve these challenges as others have failed.

India is the last major economy to recognize supplements as foods (FSSA, 2006), regulating them since 2016 (1). The first country to set regulations provides the scientific principles, definitions, scope and structure. In aligning with these, the US Dietary Supplement Health Education Act (DSHEA, 1994), the EU Food Supplement Directive (46/2002), Codex Guidelines (GL 55/2005), and ASEAN countries, including India, constitute global practice (2). Such alignments are necessary to ensure a consistent approach to consumer safety and fair trade.



a criterion to distinguish foods from medicines. The term medicinal product would mean "Any substance or combination

The terms "akin to drugs", and "unclear demarcation" refer to borderline substances whose governance domain is uncertain. It is known that some substances are hard to distinguish as foods or medicines. They remain borderline until the distinction becomes clear. The entry of innovative products in dynamic markets will likely present such challenges. The situation is not unique to India. When legislation is founded on definitions including purpose of use and modes of action, "grey areas" between food and drugs are resolved by applying them. National authorities verify that all the characteristics of the product/substance are fulfilled under its own Act, rules and regulations, on a case-by-case basis.

When competent authorities are unable to resolve borderline products, food businesses will seek legal clarity. After all, Acts are legal instruments designed for resolutions. A judgement of the European Court of Justice, 2009 (3) confirmed

of substances presented as having properties for treating or preventing disease in human beings or any substance or combination of substances which may be used in or administered to human beings either to restore, correct or modifying physiological functions by exerting a pharmacological, immunological or metabolic action or to making a medical diagnosis.

In taking such decisions it is also necessary "to consider both the emergence of new therapies and the growing number of so-called "borderline" products between the medicinal product sector and other sectors, the definition of "medicinal product" should be modified to avoid any doubt as to the applicable legislation when a product, whilst fully falling within the definition of a medicinal product, may also fall within the definition of other regulated products. This definition should specify the type of action that the medicinal product

may exert on physiological functions. Also, given the characteristics of pharmaceutical legislation, provisions should be made for such legislation to apply. Where a given product comes under the definition of a medicinal product but could also fall within the definition of other regulated products, it is necessary, in case of doubt and to ensure legal certainty, to state explicitly which provisions have to be complied with. Such readings are available in relevant Indian Acts.

Drugs and Cosmetics Act, 1940 (4) in relevant portions of its definitions reads(a) "Ayurvedic, Siddha or Unani systems of medicines, includes all medicines intended for internal or external use for or in the diagnosis, treatment, mitigation or prevention of disease or disorder in human beings manufactured exclusively following the formulae described in the authoritative books (b) a drug includes all medicines for internal or external use of human beings ... and all substances intended in the diagnosis, treatment, mitigation or prevention of any disease or disorder in human beings....





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defined in DCA. It goes on to state "It does not claim to cure or mitigate any specific disease, disorder or condition, except for certain health

benefits or such promotion claims as may be permitted by the regulations made under this Act".

The ECJ and Indian Acts provide an approach to draw a line between food and medicine and thereby their administrative boundaries. Does the presentation promote the intent of a beneficial outcome of cure, mitigation, or prevention of disease.... and is the outcome obtained by affecting the structure or function of the human body?

Does its presentation promote intent to cure:

Every food or medicinal product presents by its packaging, labelling and claims, a clear intent to consumers, trade and regulatory authorities. Ayurveda Aahar which has roots in traditional AYUSH systems of medicine is placed under FSSAI. Consumers unequivocally identify the product as food - not medicine - when labels boldly declare "AYURVEDA AAHARA" alongside a logo and advisory, 'ONLY FOR DIETARY USE'. Similarly, health supplements in

dosage forms - pills, tablets and capsules - recognized as medicinal forms, are identified by the food category name "HEALTH SUPPLEMENTS" and advisory "NOT FOR MEDICINAL USE". Regulatory authorities requiring such label declarations, "ONLY FOR DIETARY USE" and "NOT FOR MEDICINAL USE", have characterized the product and declared its administrative boundary irrespective of origin, association, form or popular viewpoints.

Secondly, the US, EU, and Codex, among others, allow nutritional and health claims in food products. Disease risk reduction claims (DRR) are authorized based on scientific evidence. For example, plant sterols and stanols, beta-glucan, and psyllium husk are food components clinically proven to lower cholesterol, a risk factor in CHD. They are thought to work by reducing the absorption of cholesterol in the gut. Statins lower cholesterol levels but also reduce the risk of fatty plaques breaking off from artery walls, reducing the risk of heart attack and stroke.

such substances (other than foods) intended to affect the structure or any function of the human body which cause disease in human beings (c) patent and proprietary medicines ... formulated containing ingredients mentioned in formulae in authoritative books of Ayurveda, Siddha or Unani systems of medicine (underlined for emphasis), but does not includea formulation included in the authoritative books as specified in clause (a). Underlined texts are for emphasis only.

The Food Safety and Standards Act 2006(FSSA), generally defines food intended for human consumption... but does not include drugs and medicinal products, cosmetics, narcotics or psychotropic substances. It further explains u/s 22, that health supplements, nutraceuticals and similarly categorised foods, which are not used as conventional food and formulated in the form of powders, tablets, capsules, liquids and other dosage forms ... and such products do not include drugs as





Health claims relate to the reduction of a risk factor, while medicinal outcomes relate to the disease.

Does it affect the structure or function of the human body: The ECJ judgement points to this essential criterion A medicinal product must show how the structure or function of the body is affected to deliver the outcome. Whether a product that is not presented as a medicinal product (e.g. supplement - not for medicinal use) can be regarded as a medicinal product because a component it contains can produce physiological changes at certain dosages, but its use - as

recommended on the label - is too low for that kind of action. Should a final decision rest on "pharmacological action" or being capable of "modifying, physiological functions in human beings. It relied on the fact that contrary to the definition of medicinal product by presentation, the broad interpretation being it is intended to have the effectiveness that consumers are entitled to expect, the definition of medicinal product by function is designed to cover its pharmacological properties which have been scientifically observed and designed to make a medical diagnosis or to restore, correct or modify

physiological function.

FSS 2016 provided the use of 439 botanicals (Schedule IV) and 249 nutraceutical ingredients (Sch. VI), apart from vitamins, minerals, amino acids, probiotics and prebiotics. The safety of these ingredients was examined by respective Scientific Panels/Committee from 2012 until final notification in 2016. Dose amounts for adults and different age groups for ayurvedic botanicals are given based on the available scientific evidence in authoritative texts.

Comparison of vitamin amounts specified

No	VITAMIN (Adults per daily dose)	Prophylactic ¹	RDA 2020	Therapeutic ¹	TUL
1	Vitamin A 1µg = 3.33IU	481-751	1000	1502 - 3003	3000
2	Vitamin D: 1µg = 40IU	2.5-5.0	15	10 - 25	100
3	Vitamin B1 (thiamine), mg	1-2	1.4	4.5 - 10	100
4	Vitamin B2 (riboflavin)	1-3	2.0	5 - 10	40
5	Vitamin B6(pyridoxine)	0.5 – 1.5	1.9	1.5 - 3	100
6	Vitamin B12 µg	0.5 – 1.0	2.5	5-15	2000
7	Niacinamide mg	15-26	14 ²	45-100	35
8	d-pantothenic acid or its salts and panthenol mg	1-5	-	5-50	-
9	Folic acid: 1µg = 1.7 dietary folate	50-300	300	1000 - 1500	1000
10	Vitamin C (mg)	25-50	80	75 - 150	2000
11	Vitamin E 1mg=1.5 d-alpha tocopherol mg	3.3 – 6.7	7.5 -10	10 – 16.7	1000

1. Wherever range value is given, means "not less than" and " not more than"
 2. Niacin equivalent





B1, B2, B6, B12 and Vitamin C, are several times lower. Both RDA/TULs and prophylactic/therapeutic amounts are defined as daily intake.

Authority of India. CDSCO: Central Drugs Standard Control Organisation. RDA: Recommended daily allowance. TUL: Tolerable upper level.

Similarly, micronutrients vitamins, and minerals are important for achieving nutrient levels in public health goals. The ICMR provided two recent publications on tolerable upper levels (TULs) in 2018 and updated RDA for Indians in 2020. Under DCA rules Schedule V, prophylactic and therapeutic amounts of vitamins, introduced several decades earlier are collated for comparison (Table).

Prophylactic amounts are within the RDA recommended by FSSAI. Therapeutic amounts are within or near TULs, provided by ICMR: vitamins

Considering the wide overlap and the expectation of different outcomes needs a scientific review of whether they satisfy the criteria under the Acts.

Modern food Acts, like FSSA, 2006, are constructed for science to precede decision-making so that administrative challenges are reduced and when they arise, are resolved accordingly. There is no assurance or even a reasonable prediction that a better resolution is available outside the FSSAI.

Abbreviations: FSSAI: Food Safety and Standards

Reference

1. ReCHaN; Compliance Guidance Version 2; September 2020: rechan.co.in
2. Food Safety and Standards (Health Supplements, Nutraceuticals...) Regulations, 2016. [Fssai.gov.in](http://fssai.gov.in)
3. European Court of Justice: Concept of medicinal product by function; [Case No 140/07](http://case-law.europa.eu); 15 January 2009.
4. Drugs and Cosmetics Act (1940) and Rules (1945): cdsco.gov.in



WASTE LESS, FEED MORE: AN ANALYSIS ON IMPACTS OF FOOD LOSS AND WASTE

“Anna he
purnabrahma”,
“अन्न हे पूर्णब्रह्म”

which means Food is
next to God.

We have heard this phrase millions of times since our childhood. This thinking comes from the belief that “food” makes up our body, mind, and soul. This underlines the importance of food in our culture. However, the reality is different. According to UNEP (United Nations Environment Programme), 68.7 million tons of food is wasted annually in Indian homes which comes out to be 50 Kg per person (1). This is very alarming for a country where millions go to bed hungry every night. Despite adequate Food Production, about 190 million Indians remain undernourished. This food waste means food ready and fit for consumption but consciously discarded at home, retail, restaurants, and social functions such as

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weddings. Apart from food waste, there is “Food Loss” which occurs before the food reaches consumers in the value chain and includes post-harvest losses, production, storage, processing, distribution, etc.

This problem of Food Loss and Food waste is a global issue (2) and not restricted to India. A 2021 meta-analysis by the United Nations Environmental Program found Food waste is a challenge to all countries at all levels of economic development. The analysis revealed that global food waste was 931 million tons (about 121 Kg per capita) of which 61% was from households, 26% from food service, and 13 % from retail. This loss or waste of food means so much additional food to be produced again. Therefore, it has a major part in the

impact of agriculture and on climate change. This amounts to 3.3 billion tons of carbon dioxide emission annually. Other environmental issues such as land use, water use, and biodiversity loss further add to environmental damage. There are ways to reduce the impact of food waste on the environment. The typical solution to any waste is “Reduce, Reuse, Recycle”. This also applies to “food waste”. Therefore, care should be taken to avoid or reduce food waste. Any surplus food can be reused by donation followed by animal feed. Recycling of nutrients or energy is the next logical step. If nothing is possible landfill is the last option.



The UN's Sustainable Development Goal Target 12.3 is "to halve global per capita food waste at retail and consumer levels and reduce food losses along production and supply chains including post-harvest losses by 2030".

Post-harvest losses of foods occur throughout the value chain from the time it is produced at the farm till the time it reaches either to consumer or to a place of manufacturing where it is used for making a product.

Post-harvest losses of fruits and vegetables are a major problem in the value chain. The losses depend on growing conditions, handling, and storage at retail levels. While growing, water is a key factor in the quality of the produce. Too much water or heavy rain will cause decay, whereas less water will affect quality causing growth cracks. Even plant food like fertilizers should be optimum. Fruits and vegetables have moisture between 65 - 95 %. Various factors such as careless handling, low humidity, and high

temperature will lead to water loss, shrinkage, and loss of weight that will affect the quality. Water loss also depends on the surface area and porosity. Thus leafy vegetables will lose moisture faster than potatoes. It is advisable to store the harvested fruit and vegetables in the correct humidity. The plants continue respiring even after harvest. Proper ventilation is required during storage. A restricted air supply during storage will lead to anaerobic conditions because of a rise in Carbon dioxide leading to fermentation. Diseases caused by fungi and bacteria lead to skin blemishes which reduce the price but are still edible after proper cleaning. Non-climacteric fruits (grapes, pineapple) only ripen on the trees and should be harvested after they are fully ripe. Climacteric fruits (bananas, papaya) can be harvested before ripening. In commercial fruit marketing, the ripening is controlled artificially to plan the transport and distribution. Fruits and vegetables are perishable and susceptible to mechanical injuries. Therefore, use of unsuitable containers, overpacking or underpacking at any stage from harvest, transport, and point of sale will cause damage and bruising on the surface. This will lead to entry points to bacteria and

fungi, loss of moisture, and increased respiration rate. The higher temperatures during the supply chain cause loss of moisture. Poor quality roads, vibrations, and overloading of vehicles also cause damage leading to loss of commodities. These losses can be avoided by providing a better-quality post-harvest infrastructure. 2023 data (4) indicates that post-harvest losses of seven fruits and eight vegetables in India were INR 32500 Cr. It is virtually impossible to assess the losses. There are so many factors that can lead to losses. Sometimes farmers themselves destroy whole crops when the market price is less than the actual inputs. Losses could be just moisture loss leading to weight loss or it could be total spoilage of produce.

The same data of 2023 (4) shows the post-harvest losses of fifteen cereals, pulses, and, grains was INR 32853 Cr. The losses start from the stage of harvesting (5, 6). Harvesting should be done at the right time.





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Delayed harvesting will lead to insect, rodent, and bird attacks leading to losses. Edible crops left in the field are another reason for losses. Grains have to undergo additional on-farm processing steps before they become a commodity to sell. Post harvesting, they undergo so many processing steps such as cutting, manual or machine threshing and cleaning, sun or mechanical drying, storage, and milling, and then go to retailers. All these operations to be done efficiently otherwise lead to losses because of insect, and fungal infections. There are losses of up to 30% and can be avoided if all these operations are done efficiently. If farmers are provided with adequate post-harvest facilities, the losses can be reduced. Organizations like IFAD (International Fund for Agricultural Development) (7) have suggested ways to reduce post-harvest food losses. With better access to finance, the farmers or Co-operative societies can afford better post-harvest equipment like threshers, and packing houses that can help reduce the losses. Better linking of farmers to the market can help them

reach buyers and assured markets. Better on-farm storage facilities like metal drums and hermetic bags will reduce rodents, microbial infestations, and moisture loss. Proper drying equipment will help reduce mould damage. Losses in fresh produce (fruit, vegetable, milk, meat) can be reduced by providing cold storage. Proper transport infrastructure is key to reducing losses. Collective storage facilities will help farmers to afford the right storage. Training of farmers on various agricultural skills like harvesting on time, and proper moisture management by crop drying will lead to reduced food losses.

A significant amount of food is wasted during manufacturing. One analysis (8) shows just below half of the edible food waste happens during manufacturing. This is not only the food that could feed people but also a loss in resources like water, labour power, soil nutrients, and transportation energy. This rejection and disposal of non-compliant products are because of inefficient process management, human error, and technical malfunctions. Minimising Food loss and waste during manufacturing will serve a good cause and increase productivity and financial benefits. Because reduced

loss means investing less in ingredients, and processing to get the same output. In addition to rejections, handling, and spillage of the products while filling and packing lead to losses. During automatic packing line start-up several pallets of packaged food, as well as packaging material, are lost by the time the line is set up to pack the right quantity of material. Cleaning and flushing of manufacturing lines while switching over from allergenic to non-allergenic products is also a reason for waste that should be optimized. Scale-up trials while developing new products also generate food waste. There are ways to reduce food waste generated while manufacturing (9). Accuracy in forecasting will help correct material management. If more ingredients are procured but produced less because of less demand, more resources will be wasted, particularly when perishable ingredients are to be used. Areas of inefficiency should be identified and measured, that will help to streamline processes and reduce waste.





While setting up a quality control system the standards should not be overzealous which might lead to rejecting perfectly usable products. Continuous training and involvement of staff and developing a work culture that supports avoiding waste is the key. The surplus food thus generated in the system needs to be properly disposed of in the following sequence: Redistribution to the people, animal feed, aerobic digestion, composting, incineration with energy recovery, landfill, or disposal in the sewage.

Because of increasing public awareness and concern for surplus food, its redistribution to people is gaining attention and is an entirely new activity in the industry. However, the redistribution leads to new challenges. The biggest challenge is commercial. Any new activity in the business will depend upon the profits it will generate. Redistribution has a social angle of thinking like concerns for the environment, climate change, and issues like global hunger. Therefore, governments need to think of incentivising schemes such as CSR for redistribution of Food waste generated while manufacturing by modifying the tax laws. Redistribution logistics will bring in

different sets of challenges. This includes the uncertain volumes of Food waste (safe to consume) generated, which must be repacked, labelled, stored, and going through the regular supply chain. This has further to reach needy people. This calls for new ways to use technology such as blockchain, reaching to NGOs and needy people. All work is expected to be voluntary work for the people in this chain.

Food safety recalls (10) are another reason that leads to Food waste. If there is news about an outbreak of salmonella in raw chicken it will create panic in the markets. The recalled food goes to landfill or incineration. The panic creates ripple effects in the market. Manufacturers try to pull back all such products in the market. Consumers try to avoid these products and they go off the menu of restaurants. This kind of problem underlines the importance of food safety and traceability. If these systems are in place, the damage of such recalls can be minimized by assuring consumers that only affected food is called back.

On-pack information about expiry date is another

reason for Food waste. (11) "Use by date" and "Best before date" confuse the consumers. Many times, they avoid buying or discard the products too early on the safer side. Then such short-expiry goods are returned to manufacturers which cannot be used for the purpose they are created. Additional on-pack information about "Best before" (Often good after date. Look, smell, and taste) and "Use by" (Do not use after date) will have a positive impact on consumers.

As mentioned in the introduction, food waste from homes, restaurants, and social events like big fat weddings is a huge problem. Many people travel alone for business and personal reasons. Whenever they order food at restaurants, the portions could be big and they cannot take them home as they are traveling.





can feed so many hungry people. Awareness about this important issue touching our lives is essential.

Restaurants can offer half the quantity at 70% price will save food waste in a win-win situation. In this age of technology, many apps (12) connect people, and NGOs with homes, caterers, and supermarkets so that there is a flow of information between the needy and food that is available for free or at a discounted price.

There is a double impact of food waste and loss on human life. First is an environmental impact because of more food to be produced. When it comes to food waste, there is also a lot of effort, and energy is lost to produce the food from farm to retail. Another equally important thing is if we can save this food, we

References:

- 1) https://timesofagriculture.in/food-wastage-in-india-farm-to-bin/#Post-Harvest_Losses
- 2) https://en.wikipedia.org/wiki/Food_loss_and_waste
- 3) [https://en.wikipedia.org/wiki/Post-harvest_losses_\(vegetables\)](https://en.wikipedia.org/wiki/Post-harvest_losses_(vegetables))
- 4) <https://pib.gov.in/PressReleasframePage.aspx?PRID=1910360>
- 5) [Reducing Postharvest Losses during Storage of Grain Crops to Strengthen Food Security in Developing Countries - PMC \(nih.gov\)](#)
- 6) https://www.actioncontrelafaim.org/wp-content/uploads/2018/01/technical_paper_phl_.pdf
- 7) <https://www.ifad.org/en/web/latest/-/story/10-ways-to-reduce-food-loss-lessons-from-the-field>
- 8) [Enormous amounts of food are wasted during manufacturing - here's where it occurs \(theconversation.com\)](#)
- 9) [Top Tips to Reduce Food Waste During Processing | Food Engineering \(foodengineeringmag.com\)](#)
- 10) [Food Waste Is an Oft-Ignored Impact of Food Recalls - FoodPrint](#)
- 11) <https://www.wur.nl/en/newsarticle/on-pack-information-about-expiry-dates-can-change-food-waste-behaviours-in-households.htm>
- 12) <https://www.oddbox.co.uk/blog/7-apps-that-are-helping-reduce-food-waste>



WHEY PROTEINS: TYPES, BENEFITS AND APPLICATIONS

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For many people, milk and its products are an essential part of their everyday diet. Milk is made up of two major proteins casein and whey protein. For simpler understanding, when milk coagulates, the solid curd formed is casein protein whereas the liquid that remains is whey protein. Whey protein is sold mostly in powdered form. It is often recommended as a dietary supplement and consumed by athletes and gym enthusiasts as it aids in muscle building and muscle retention.

Composition:

The total protein content of

milk is 36g/L. Casein makes up 80%(29.5 g/L) whereas whey protein makes up approximately 20%(6.3 g/L) of milk protein(9). Whey proteins are globular proteins composed of lactalbumin, lactoglobulin, serum albumin, immunoglobulins, lactoferrin, lactoperoxidase, and glycolmacropeptide. Whey protein composition also varies based on whey type (sweet or acid whey), milk type, cattle feed type, and processing method. Acidic whey is produced through direct acidification, while sweet whey is produced through rennet-coagulation (7). These proteins are more hydrated than casein. Its hydrophilic nature allows it to bind large amounts of water. They denature by heat as opposed to casein which precipitates by acid, making

them suitable for acidic beverages like sports drinks(1).

From Milk to Whey-

Whey production dates back over 3000 years B.C. when Bedouins carried animal milk in bags across the desert. The heat in the desert coagulated milk, resulting in an acid liquid (whey) on top of a milk curd. Sometimes they observed a sweet yellow liquid (whey) on top of curd (cheese) when they carried their milk in sacks of dried animal stomachs through the desert. The dried stomachs were able to clot milk proteins caused by the residual enzymes present in the stomach of that animal(4).



Today most of the whey is obtained from the production of various types of cheese. In large-scale industrial settings, the milk from the farms is standardized (fat content between 2.5% to 4.5%) and pasteurized (72°C/ 15 seconds). The milk is then cooled down and inoculated with a starter culture and rennet. The starter culture gives the characteristic cheese flavour and the rennet induces coagulation of the protein molecules. Once the gel is set it is cut into cubes leaving behind the supernatant liquid whey. One-third of this whey produced is drained off and replaced with hot water. This scalding process causes the curd to shrink and a continuous pre-processing system squeezes out all the whey till the curd/cheese of desired firmness and shape is achieved. The collected whey still has 0.2-0.5 % milk fat and fine curd particles which can be separated using centrifugation. After removal, a clear yellow-coloured solution is obtained due to the

presence of vitamin B2. This whey is further processed to get different forms of whey proteins. Processing can be as simple as drying, or the protein

content can be increased by removing other non-protein materials, typically lactose, minerals, and fats. Spray drying after membrane filtration can separate proteins from whey. Whey proteins undergo a variety of processing treatments, resulting in whey products with varying protein profiles, minerals, lipids, and sugars (4).

There are three major forms of whey protein -

1. Whey protein concentrate - Whey protein concentrates (WPC) are produced with the use of selective membranes including ultrafiltration (UF) to concentrate proteins and diafiltration (DF) to remove minerals, lactose, and other low-weight components from the whey. It is the most concentrated form of protein supplement with high calories and all the macronutrients and micronutrients. Whey protein concentrates (WPCs) come in various protein concentrations: low (25% - 45%), medium (45% - 60%), and high (60% - 80%). They

are low in fat and cholesterol but rich in bioactive compounds and lactose. WPC-35 is used as a skim milk replacement, WPC-60 can substitute for egg white in bakery and confectionary items, and WPC-80 in meat and fish products (4, 7, 2).

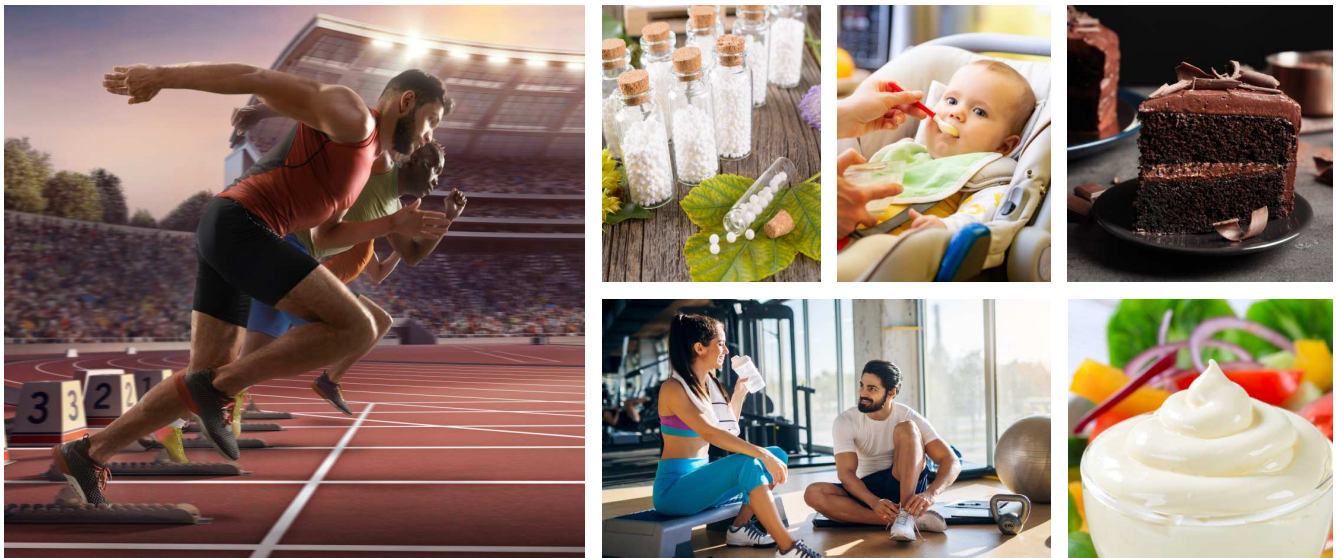
2. Whey protein isolate - When almost all of the components are removed from the whey, it goes through an additional purification step (usually ion exchange or electrodialysis) to eliminate or reduce the extraneous carbohydrates and fats to achieve a protein level of 90%, it is referred to as whey protein isolate (WPI). Isolated whey protein is high-quality, but the purification process removes some of the micronutrients and protein fractions such as lactoferrins, lactoglobulins, and immune-globulins (7,2).

3. Hydrolyzed whey protein - As concentrates and isolates are composed of large protein molecules, the enzymes in our digestive tract break them down into smaller peptides. To accelerate protein absorption, manufacturers pre-digest the protein to produce protein hydrolysates. WPCs and WPIs are treated with acids, enzymes, or heat to degrade the protein molecules which results in the formation of whey protein hydrolysates.



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denaturation - Whey protein solubility is important in determining their applications in food products. Particle size and temperature influence their

groups, the hydrophilic sites of the whey protein molecule bind water, while the hydrophobic sites bind fat, stabilizing the mixture. Whey protein concentrates (WPCs) with α -lactalbumin and β -lactoglobulin have emulsifying properties, however, β -lactoglobulin-enriched whey proteins are more effective.

The final composition of the hydrolysate is largely determined by hydrolysis conditions used to break down the proteins and the enzymes used. The higher the degree of hydrolysis, the fewer amino acids per peptide, resulting in more bitter peptides.

Allergenicity in whey protein is one of the concerns with β -lactoglobulin and α -lactalbumin being the major allergens. Hydrolysates reduce the chances of triggering the allergy, as these proteins are broken down into smaller peptides (7).

Whey proteins have many functional properties. They are soluble across a wide range of pH. They can form firm gels when heated, have good fat and water-binding properties when denatured, and are good foaming agents. Whey proteins play an important role in controlling the texture of many foods. Let's understand some of the functional characteristics of whey proteins.

1. Solubility and thermal

water-binding capacity. Whey proteins display varying solubilities due to different production methods. They are highly susceptible to heat, heat causes protein molecules to denature and interact with each other to form aggregates(7, 5).

2. Gelation - Whey proteins have good gelling characteristics. Gelation occurs when the protein molecules denature upon heating and form aggregates when cooled. The formation of gels depends on factors like protein type, concentration, temperature, pH, and calcium. Gelation of these proteins can be improved if calcium salt is added before heat. WPC forms gels and varies in appearance from stiff transparent gels to curd-like opaque gels.

3. Emulsification - Emulsion is a mixture of two immiscible liquids (e.g. oil and water). Whey proteins act as an emulsifier, they contain hydrophilic and hydrophobic

4. Foaming - Foams develop when proteins interact with air and water, it reduces the tension between the two. These proteins create a cohesive film, which stabilizes the foam, preventing it from collapsing. WPC has advantages such as being bland in taste and stable at a range of pH levels, making it a suitable option for various food applications where foaming properties are desired. It is used in products like whipped toppings and meringues. In the production of frozen yogurt, substituting some of the skim milk solids with whey protein concentrate (WPC) can lead to improved body, texture, and consistency in the final product (6,7, 2).



Consumption of whey proteins has been associated with many health benefits. They protein contains the most branched-chain amino acids (BCAAs) of any protein source (23-25%). This BCAA content is important for athletes because BCAAs are an integral part of muscle metabolism and are the first amino acids used during intense exercise and muscle damage. Whey can increase Glutathione (GSH) production which is the most powerful naturally occurring antioxidant in the body that supports the immune system. Whey has a high bioavailability due to its excellent amino acid profile, solubility, and digestibility. Whey protein has the potential to address a variety of metabolic imbalance-related diseases. So far, anticancer, antidiabetic, anti-obesity, and cardioprotective functions have been established (8, 2).

Applications:

1. Infant food formulation:

Infants are born with underdeveloped organ functions; hence it is necessary to meet the specific nutritional requirements in the early stages of their life. Whey proteins are widely used in infant nutrition due to their high nutritional value. Whey proteins provide both essential amino acids and non-essential amino acids to the growing baby.

Lactoferrin in whey protein enhances iron absorption. It has a high protein efficiency ratio and is easy to digest.

2. Meat/fish products:

Whey protein is used in meat and fish products to enhance the mouthfeel. It is also used where low-fat content is desired. WPC-80 can easily replace eggwhite powder in fish minced products and traditional Japanese products like Surimi. Because of WPC's excellent gelling properties, the protein reinforces the gel that is formed by the fish protein; it binds to water and makes the product whiter and glossier.

3. Dairy products:

Whey protein is often used in yoghurt manufacturing. Addition of WPC has shown better gel strength, increased viscosity, and reduced the oozing out of liquid from the yoghurt. It is also used in low-fat dairy products as it acts as a good fat replacer. Ricotta, a whey cheese is used in a lot of Italian dishes.

4. Bakery products and confectionery:

In the bakery industry, whey is used as an alternative to egg and skim milk powder. Whey proteins are used in many food products like breads, cakes, muffins, and icing. WPCs and isolates

are used in confectionery like candies, jellies, and chewing gums.

5. Other applications: Whey protein can also be used in edible films/coatings for different products. These coatings are biodegradable and act as a protective barrier which improves the shelf life of the product. Encapsulation is another application of the whey proteins. Owing to their structural and functional properties, they act as good encapsulating agents(5, 3).

It is important to know that whey protein is safe for adults when taken appropriately. If an individual is unaware, it is best to take it under an expert's advice to cater to specific needs and purpose. Adverse effects are seen when it is consumed in excess and beyond the recommended dose.





Excess consumption of whey protein can lead to adverse effects on kidney and liver functions. Many people are lactose intolerant which means they are allergic to milk and dairy products that contain lactose. As whey proteins are part of milk, these people can opt for WPI and hydrolysed forms of whey protein as they are processed to remove fat and lactose (2).

For decades, whey which was largely considered a waste of the dairy industry has turned out to be a very important source of protein for humans. In today's fast-paced world, it has become a convenient option to help with the protein requirement of the body. The versatility, nutritional value, and functional

properties of whey protein makes it a valuable ingredient and have promising growth across different sectors.

References-

1. Vaclavik et al. (2007). Essentials of Food Science. Springer Science & Business Media
2. Gangurde H., et al. (2011). Whey protein. Scholars' Research Journal. (https://www.researchgate.net/publication/313715199_Whey_protein)
3. Shinde G. et al. (2018) Whey Proteins: A potential ingredient for food industry- A review (https://www.researchgate.net/publication/330086322_Whey_Proteins_A_potential_ingredient_for_food_industry- A_review)
4. Dr.J.N de Wit, (2001) Lecturer's Handbook on whey and whey products (https://ewpa.euromilk.org/fileadmin/user_upload/Public_Documents/EWPA_Publications/Lecturer_s_Handbook_on_Whey.pdf)
5. Sharma K, et al (2018), Multifaceted whey protein: Its applications in Food Industry (https://www.ijhsr.org/IJHSR_Vol.8_Issue.10_Oct2018/38.pdf)
6. DT-7: Lesson 39 Functional properties of whey proteins (<http://ecoursesonline.iasri.res.in/mod/page/view.php?id=5558>)
7. Minj, S., & Anand, S. K. (2020), Whey Proteins and Its Derivatives: Bioactivity, Functionality, and Current Applications (<https://doi.org/10.3390/dairy1030016>)
8. Patel S. (2015), Functional food relevance of whey protein: A review of recent findings and scopes ahead. (<https://doi.org/10.1016/j.jff.2015.09.040>.)
9. Davoodi SH, et al Health-Related Aspects of Milk Proteins ([https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5149046/#:~:text=Casein%20and%20whey%20protein%20are,%2D%20micelle%20complexes%20\(20\).](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5149046/#:~:text=Casein%20and%20whey%20protein%20are,%2D%20micelle%20complexes%20(20).))



HEALTHY GUT: THE ROLE OF FUNCTIONAL FOODS IN GUT HEALTH

Recently, functional foods have become the centre of a new business, with a wide range of goods featuring the shelves of supermarkets and health food stores. Surprisingly there isn't a single, globally accepted definition of what constitutes a functional food.

While their exact definition is still up for debate, most people believe that they are nourishing foods or food ingredients that have advantages above conventional nutrients and have the potential to enhance health. For instance, the physiologically active food compounds, such as the beta-glucans found in oats and barley and the omega-3 fatty acids in flax or fish oils, may lower the chance of developing certain diseases.

Firstly, let us understand the gut: The importance of gut health for general well-being has come to light

more and more in recent years. A healthy gut is associated with many elements, such as the immune system, mental well-being, and regulation of inflammation. It is not just about digestion anymore. Trillions of microorganisms called the gut microbiota reside in the human gut. The complex structure of bacteria, viruses, fungi, and other microorganisms within the digestive system is essential for preserving a stable and harmonious environment. Irritable bowel syndrome (IBS), inflammatory bowel disease (IBD), and even mental health illnesses have all been related to dysbiosis, an imbalance in this microbiota.

As a population, we have become more self-aware and responsible for our health. This deep concern for our well-being combined with the rapid development

of the data proving functional nutrition. Customers are turning to food as a natural, easily accessible preventative treatment to lower their chance of developing chronic illnesses.

Functional foods have become important in supporting gut health since they are particularly made to offer health advantages above and beyond basic nutrition. Certain functional foods have the potential to positively impact the composition and activity of the gut microbiota in terms of gut health. (1)

The following are some essential functional foods that are well-known for improving gut health:

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1) Prebiotics and Probiotics:

- Live microbes known as probiotics, when taken in sufficient quantities, offer many health advantages. Fermented foods such as kimchi, kefir, yogurt, buttermilk, curd, pickles, and sauerkraut contain probiotics. They enhance the immune system and digestion by assisting in the maintenance of a balanced population of good bacteria in the gut.
- Prebiotics are a class of dietary fibre that includes carbohydrate polymers including oligosaccharides and polysaccharides, which specifically promote the growth of good gut flora. It has been discovered that polysaccharides have immunomodulatory qualities, which are important for boosting cellular immunity and resisting viral infections. The growth and function of probiotics is closely linked to prebiotics.
- Through effector molecules, which are present in yogurt and fermented beverages and are becoming more widely available in the bakery, snack, and gummy sectors, probiotics are known to regulate the gut's environment. Probiotics, break down different types of prebiotics, such as

fructans, glucan, and arabinoxylan. This process produces short-chain fatty acids (SCFAs) that have been shown to regulate the host immune system. (2)

- Probiotics have received the most popularity among new ingredients in the market.

2) Fiber-rich foods:

Fiber-rich foods play a crucial role in promoting gut health. Dietary fiber is a type of carbohydrate that the body cannot digest, but it is essential for maintaining a healthy digestive system. There are two main types of dietary fiber: soluble and insoluble.

- **Soluble Fiber:** Found in foods like oats, barley, beans, lentils, fruits, and vegetables. It dissolves in water to form a gel-like substance, which can help lower cholesterol levels and stabilize blood sugar levels. Soluble fiber is fermented by bacteria in the colon, producing short-chain fatty acids (SCFAs), which are beneficial for gut health.
- **Insoluble Fiber:** Found in whole grains, nuts, seeds, and the skin of fruits and vegetables. It adds bulk to the stool and helps prevent constipation by promoting regular bowel movements.
- **How Fiber Benefits Gut Health:**
Promotes Healthy Microbiota: Dietary fiber serves as a prebiotic, providing a food source for beneficial bacteria in the gut. The fermentation of fiber produces SCFAs, which

nourish the cells lining the colon and support a healthy microbiome.

Regulates Bowel

Movements: Insoluble fiber adds bulk to the stool, preventing constipation and promoting regular bowel movements. Soluble fiber can help manage diarrhoea by absorbing excess water and forming a gel-like substance.

Supports Immune Function:

A healthy gut microbiota is linked to a robust immune system. Fiber promotes the growth of beneficial bacteria that contribute to immune function.

Helps Manage Weight: High-fibre foods are often more filling and can help control appetite, contributing to weight management.

Reduces Inflammation:

Some studies suggest that a diet rich in fiber may help reduce inflammation in the body, including the gut.

3) Omega 3 fatty acids:

- Omega-3 fatty acid is vital for many body processes. These include lowering inflammation, enhancing cognitive function, and maintaining cardiovascular health. Although research on the exact connection between gut health and omega-3 fatty acids is still in progress, there is some evidence to support the potential benefits of omega-3s.



VITAMIN D KI TAAKAT





- DHA (docosahexaenoic acid) and EPA (eicosapentaenoic acid), in particular, have anti-inflammatory properties. Omega-3 fatty acids may help regulate the immune response and reduce inflammation in the gut. Prolonged inflammation in the gut is linked to a number of digestive illnesses, including Crohn's disease and ulcerative colitis. (3)
- The intestinal barrier helps to prevent the entry of harmful substances into the bloodstream, omega-3 fatty acids have the potential to maintain the integrity of this barrier hence reducing the risk of Leaky gut syndrome.
- You may naturally boost your overall health and even improve your gut by including foods high in omega-3s, such as walnuts, flaxseeds, chia seeds, and fatty fish (salmon, mackerel, and sardines).

4) Fermented foods:

- Foods that have undergone fermentation may benefit gut health. Some food components can be predigested by the fermentation process's enzymes, which will facilitate the body's

absorption of those nutrients.

- For those who are lactose intolerant, this can be especially helpful because some fermented dairy products, like yogurt, may have reduced lactose content. Fermentation by the bacteria breaks down lactose to lactic acid. The increasing pH as the yogurt enters the small intestine and a slower gastrointestinal transit time allow the bacterial lactase to be active, which will further digest lactose from yogurt sufficiently to prevent symptoms in lactose-intolerant people.
- Some minerals can become more bioavailable by fermentation, which facilitates the body's easier absorption of such nutrients. For instance, the fermentation process of grains can liberate minerals for absorption and break down anti-nutrients like phytates. Individual reactions to fermented foods can differ, so it's best to incorporate them gradually into your diet—especially if you're not used to eating them.
- A few commonly available fermented foods are yogurt, dry curd cottage cheese or fermented cottage cheese, certain aged cheeses (check the label for live and active cultures), fermented vegetables, miso, and

pickles (in salt, not vinegar)

For general wellness, gut health must be maintained, and obtaining and maintaining gut health is greatly supported by functional food. You may maintain a diverse and solid gut microbiota by including a range of probiotics, prebiotics, fibre, omega-3 fatty acids, and fermented foods in your diet. With the growing comprehension of the gut-brain axis and the gut-immune system relationship, functional foods play an increasingly important role in supporting gut health. Adopting a diet high in these functional foods is a proactive way to support the health of your gut and improve your general well-being.

References:

- 1) <https://badgut.org/information-centre/health-nutrition/functional-foods/#:~:text=Other%20highly%20touted%20functional%20foods,contain%20sufficient%20active%20bacterial%20cultures.>
- 2) <https://www.mdpi.com/2072-6643/15/11/2631>
- 3) Durkin LA, Childs CE, Calder PC. Omega-3 Polyunsaturated Fatty Acids and the Intestinal Epithelium—A Review. *Foods*. 2021; 10(1):199. <https://doi.org/10.3390/foods10010199>



IMPORTANCE & ADVANTAGES OF INCORPORATING PROCESSED FOODS IN DIET

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Globally consumption of processed foods has increased and, in some cases, it may be excessive especially of the type which may be high in fat, sugar and salt with lower amounts of dietary fibre and micronutrients. However, processing is not done only to produce such food products. In fact, whether produced in large scale with machines or at home mostly manually, excessive consumption of such foods would cause various lifestyle diseases.

Foods were processed for many reasons. Preservation to avoid spoilage and wastage is one of the main reasons. Fresh foods such as fruits, vegetables, milk, eggs, meats etc. are highly perishable and if they are not consumed within a short

time, they would spoil because of microbial and/or biochemical changes, making them inedible or unsafe for consumption. Even shorter time storage for a day or more under ambient conditions reduces the nutritive value. Processing not only prevents or reduces losses due to spoilage but also reduced nutrient degradation especially when chilled or frozen.

Nutrient & Quality Losses During Processing

Most processing will incur some losses of nutrients and sensory quality changes in flavour, colour and texture. Some of the changes are actually desirable. When we cook the food at home, for example, pan fry dosa, make omelette or roast chicken, a typical flavour develops which is highly desirable. This is because of reactions between components present in foods, some of which may be nutrients like protein or micro-nutrients. There are

changes in colour when we toast bread slice and textural changes like softening of potatoes upon cooking.

Some of the changes are desirable and some undesirable. If too much heat is applied burnt odour is formed that is undesirable. Slow cooking or low temperature holding will cause greater losses of nutrients. Thus, any process of heating, drying, storing for long etc. will result in losses. At home, we don't have the ability to conserve nutrients as efficiently as with machines in a factory. Still, we try to use some utensils which do the same. For example, for heating people at home use microwave oven rather than traditional gas fired or electric oven.



Frozen vegetables and fruits harvested at the peak of their development when nutrients and colour, flavour and texture are maximum and these are immediately processed in factories located nearby before over-ripening or spoiling. On the other hand, the fresh fruits and vegetables available in our urban markets come from large distances where they are grown and are transported in humid and hot conditions. In order to prevent mechanical losses these are harvested before they are fully ripe with maximum nutrients and eating quality. They are green and hard to withstand travel. After reaching the markets they are artificially ripened to become soft and colourful. However, they usually have lesser nutrients and quality compared to those frozen. Thus, processing in some cases can be better than fresh, unless you have fruits and vegetables growing nearby.

Improvement of Nutritional Quality & Safety by Processing

When milk is boiled at home, either pot or milk-cooker is used. After boiling, milk is kept for a long time to cool, during

which time, the heat contained in it continues to degrade heat sensitive nutrients. Machines in factory such as heat-exchangers allow very rapid heating and rapid cooling that destroys pathogens but minimises losses of these nutrients.

There are many anti-nutritional factors such as protease inhibitor, lectins, phytates and oxalate etc. present in many plant foods that lower the availability of nutrients including proteins, minerals etc. Many pulses and grains may contain them. These need to be removed by heat or some other processing to make the food more nutritious. Cooking may partially remove them but other methods such as soaking, fermentation and sprouting also reduces them. Combination methods have been found to be useful.

Although our grandmothers knew how to process them, we either have forgotten them or do not have time for them. Moreover, different foods have different types and amounts of antinutritional factors requiring different treatment. When industry uses these food ingredients, they do proper study or processes and optimise them before using them. Improper application leads not only to unsafe foods but

also incurs losses of nutrients. Newer processes such as cold plasma have been developed for reduction of antinutritional factors with improved bioavailability of nutrients.

As our diet lacks some of the micronutrients and it is difficult in many instances to fulfil those deficiencies through common foods alone. Then we need to add these micronutrients into our diets through fortified foods. Thus, we fortify salt with iodine and iron, wheat flour with B-vitamins, milk and oils with vitamins A and D and rice kernels with vitamins and minerals. All these have shown very effective removal of deficiencies of target nutrients in the populations where these were introduced. All these fortifications are possible due to various processing methods including extrusion.

Does Processing Alone Lower Nutritive Quality

Any processing including that done at home, incurs losses of nutrients. However, the problems of non-communicable diseases are more to do with high fat, sugar and salt in foods whether prepared at home or in factories. The





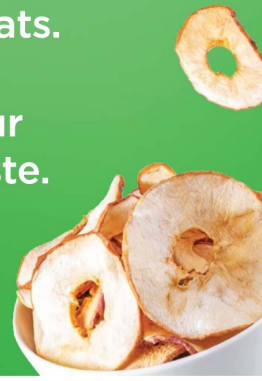
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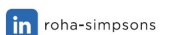
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processing much lesser a problem than the formulation of the food product. Whether the foods have lower nutritive value because of processing or formulation should be the basis of the evaluation quality of food. Also using additives that have been proven safe at the level of their inclusion should not make foods unhealthy. Using number of ingredients has no logical relationship with health effect. In fact, there are mixtures of several seeds and nuts considered as healthy.

This kind of unscientific and confusing classification is difficult to understand and may spook consumers away from any food that is packaged whether it is HFSS or processed or minimally processed or the so-called ultra-processed. The healthy processed foods such as frozen vegetables, fortified staples and those with added protein isolates to improve protein status of the population, will all be looked at suspiciously by consumers who cannot make any distinction.

Going forward, efforts should be to educate consumers in selecting foods rich in nutrients whether fresh or processed. As more

foods are being processed and marketed, consumers should be encouraged to look at the labels. Regulators are devising various means of rating the quality of the food products based on nutrients. This is the best option that would help consumers select healthier options of food products. Industry should also participate in this process of not only improving the nutritional quality by limiting the presence of fat, sugar and salt along with ensuring adequate amounts of dietary fibre and proteins and various micronutrients. It should further create awareness about the nutrition and health along with the appeal of food products for better taste and flavour.

References:

Fresh vs Frozen Fruit & Vegetables - Which Are Healthier? Mary Jane Brown, Healthline ([Fresh vs Frozen Fruit and Vegetables – Which Are Healthier? \(healthline.com\)](https://www.healthline.com/nutrition/which-are-healthier-fresh-vs-frozen-fruit-and-vegetables))

Nutrition and Cost Comparison of Select Canned, Frozen and Fresh Fruits & Vegetables, Miller et al. Am J Lifestyle Med 2014 ([Nutrition and Cost](https://doi.org/10.1007/s12220-014-9600-0)



[Comparisons of Select Canned, Frozen, and Fresh Fruits and Vegetables - Steven R. Miller, William A. Knudson, 2014 \(sagepub.com\)](#)

Plant food anti-nutritional factors and their reduction strategies: Samtiya et al. Food Production Processing & Nutrition 2, 6 (2020) (<https://fppn.biomedcentral.com/articles/10.1186/s43014-020-0020-5>)

How to Reduce Antinutrients in Foods, ML Johnson, Healthline Aug 2023 (<https://www.healthline.com/nutrition/how-to-reduce-antinutrients>)

Fortification - Food Safety & Standards Authority of India (<https://fortification.fssai.gov.in/#>)

Ultra-processed Foods: Bad Nutrition or Bad Definition? Monteiro & Monteiro, ACS Food Sci Technol 2022, 2, 613-615 (<https://doi.org/10.1021/acfoodscitech.2c00087?urlappend=%3Fref%3DPDF&jav=VoR&rel=cite-as>)



WEBINAR ON PLANT-BASED PROTEINS: THE CANVAS FOR INNOVATION

REPORT BY

Ms. Sanyukta Telange,
Food Technologist &
Regulatory Support, PFNDAI



Protein Foods & Nutrition Development Association of India (PFNDAI) organized a Webinar on 'Plant Based Proteins: The Canvas for Innovation' on 17th May 2024. The event was sponsored by International Flavours and Fragrances (IFF).

The welcome address of the webinar was given by Dr.

Jagadish
Pai, Editor
at PFNDAI.

He welcomed the speakers, panellists, and the participants.



He thanked IFF for sponsoring the webinar. Plant-based proteins have been used in industry and have had ups and downs, but we are headed towards the right goal. With the help of industry, government, supporting organizations, and individuals the goal of reducing the burden on the environment due to excessive consumption of resources can be achieved.

Additionally, plant-based proteins have their health benefits, with all of the aspects covered during the webinar, he ensured that everyone would find it informative.

Ms.
Samreen
Shaikh, Jr.
food
technologist
at PFNDAI
introduced

the speakers for the session, providing a brief about their background, qualifications, and expertise.



Dr. Shashank
Bhalkar,
Executive
Director,
PFNDAI
delivered the
talk on 'Plant-
based: Health
advantages & changes
needed to incorporate



in today's diet'. He highlighted the implications of the rising world population, land footprint, and freshwater footprint of protein sources like beef, pork, chicken, soybeans, and microalgae, emphasizing that plant-based proteins use fewer resources and are less harmful to the environment. The IMRB (Indian Market Research Bureau) survey revealed that over 80% of Indians are protein deficient, primarily consuming carbohydrates and protein through grains. Animal proteins have higher PDCAAS and essential amino acids, while plant proteins are less absorbable and digestible.

The shift to plant-based proteins offers health benefits, sustainability, and reduced environmental impact, preventing animal sacrifice. Dr. Bhalkar discussed the benefits and challenges of plant-based proteins, including health issues like leaky gut and autoimmune effects. He highlighted commercially exploited plant protein sources like soy, pea, peanut, algae, leaf protein concentrate, and millet. He concluded by discussing the theme of Protein Day 2024; #solvewithprotein, aiming to provide protein-rich food and build a healthy, nutritionally secure nation.

Mr. Indranil Chatterjee, Regional Product Line Manager - Business Unit Protein for IFF, gave a talk on 'Plant-based



protein: Challenges in plant-based proteins and how to overcome challenges in creating plant-based protein with solutions.' He discussed the functionality of muscle protein in emulsified meat products, highlighting the challenges of mimicking colour, structure, aroma, flavour, and taste in plant-based proteins. He explained that plant proteins have a globular structure, while

animal proteins have fibrous structures. The texture of plant-based products is influenced by functionalities like solubility, emulsification, gelation, water-binding, and elasticity. Salt is a crucial factor in modification, as it dictates the protein's behaviour in food. He also discussed the texture analysis of plant-based products using web diagrams and mouthfeel wheel. Plant proteins suppress flavour more than animal proteins, and authenticity is crucial when creating plant-based products. Off-notes in plant proteins can be due to protein sources and processing conditions, with bitterness and astringency being common taste issues. Mr. Indranil suggested choosing sources with lower flavour intensities, such as oat rice, for developing new products. Masking technology is used to reduce certain flavour components like bitterness. Lastly, he discussed the challenges in plant-based protein beverages.



talked about 'Rising demand for high protein intake/Better understanding of plant-

based foods.' She started the talk by explaining the importance of protein in the human body and the lack of awareness about balanced diets in India. The government of India has taken steps to promote protein uptake, such as improving protein in MID DAY MEAL, RASHTRIYA POSHAN MAAH, POSHAN PAKHWAD, and Eat Right India by FSSAI. Consumers are increasingly purchasing high-protein products, and the preference for plant-based proteins is driven by sustainability and animal cruelty. The market size for plant-based proteins is estimated at 0.91 billion USD in 2024 and is expected to reach 1.21 billion USD by 2029 at a CAGR of 5.85%. She also highlighted the innovation of plant-based proteins in India and globally, discussing growth opportunities and challenges.

After every presentation, **Ms. Simran Vichare**, Nutritionist at PFNDAI



coordinated the questions raised by the attendees. The speakers enthusiastically answered the questions raised.

A panel discussion followed the presentations. Ms. Samreen Shaikh introduced the Panel moderator and panellists.

Dr. B Sesikeran, Chairman, Scientific Advisory Committee, Hon. Scientific Director, PFNDAI, former director, NIN(ICMR) as the Panel moderator and **Ms. Naaznin Husein**, Founder-Director, Freedom Wellness Management, Chairperson-Nutrify Today Dietetics, **Mr. Nikhil Nair**, Product Development Manager-Foods, Marico Limited, **Ms. June Swer**, Strategic Business Unit head, Chatha Foods Pvt. Ltd. and **Dr. Vidya Sridhar**, Senior Manager Food Designer, Amway Global Services India Pvt. Ltd. as panellists.

acids and is not lost during processing. She also highlighted that affordability, regulatory compliance, allergenicity, and availability are considered when developing plant-based proteins.

palatable plant-protein based products.

Mr. Jayant Kapre, Sub Regional Lead, Indian Sub-Indian Continent, IFF presented a vote of thanks on behalf of IFF. He thanked the speakers, panellists, PFNDAI Team and the attendees for asking probing questions. He further expressed his thoughts on plant protein and the vested interest of IFF in creating awareness about plant-based proteins and making them palatable to consumers.



Mr. Nikhil Nair talked about protein deficiency in India, as the majority of Indians are primarily vegetarian. He suggested consuming foods of a complementary nature to overcome this issue.



Dr. B Sesikeran asked the questions to each panellist. He moderated the session well and expressed his thoughts post the answers given by the speakers.



Ms. June Swer discussed the scope and market of developing high-protein traditional Indian foods in a vegan way, and the awareness raised by PBFIA (Plant Based Foods Industry Association) working with government agencies like FSSAI and APEDA.



At the end of the session, **Ms. Sanyukta Telange**, Technical Assistant, PFNDAI gave a vote of thanks to the webinar sponsor, speakers, and panellists, along with her PFNDAI team members for making the webinar a success. She also thanked the attendees for patiently attending the webinar.



Dr. Vidya Shridhar discussed the loss of nutrients due to processing plant-based protein and the need for formulation and fortification to overcome this. She emphasized that protein is consumed for its amino



Ms. Naaznin Husein discussed the health advantages of plant-based proteins in the diet and the need for a wider choice of



The entire webinar recording is available on the following link: <https://fb.watch/sl4qb2hd0E/>



RESEARCH IN HEALTH & NUTRITION

PROTEIN FOODS AND NUTRITION DEVELOPMENT ASSOCIATION OF INDIA

Eggs may not be bad for your heart after all

Science Daily March 28, 2024



Whether you like your eggs sunny-side up, hard boiled or scrambled, many hesitate to eat them amid concerns that eggs may raise cholesterol levels and be bad for heart health.

However, results from a prospective, controlled trial show that over a four-month period cholesterol levels were similar among people who ate fortified eggs most days of the week compared with those who didn't eat eggs.

Overall, the PROSPERITY trial provides encouraging evidence that eating fortified eggs, fortified with vitamins, minerals and omega-3, even in higher quantities, does not have a negative impact on cholesterol levels or other markers of cardiovascular health over a four-month period. This is particularly important for individuals with or at risk for heart disease who may have been hesitant to include eggs in their diet due to concerns about cholesterol. The study's findings suggest that fortified eggs could be a safe and beneficial part of a heart-healthy diet for this population.

While this study sheds light on the potential benefits of

fortified eggs, it is important to note its limitations, such as its small size and reliance on self-reported dietary information. Larger, more robust studies are needed to further investigate the effects of fortified eggs on cardiovascular health. Additionally, it is important for individuals to consider what they are eating alongside their eggs, as unhealthy accompaniments like bacon and processed meats can negate the potential benefits of the eggs themselves. As always, individuals with heart disease should consult with their healthcare provider about their dietary choices to ensure they are following a heart-healthy diet.

<https://www.acc.org/About-ACC/Press-Releases/2024/03/28/11/43/eggs-may-not-be-bad-for-your-heart-after-all>

A research consortium led by Nestlé Research in Switzerland and the Yong Loo Lin School of Medicine, National University of Singapore (NUS Medicine) made a recent discovery that the natural molecule trigonelline present in coffee, fenugreek, and also in the human body, can help to improve muscle health and function.

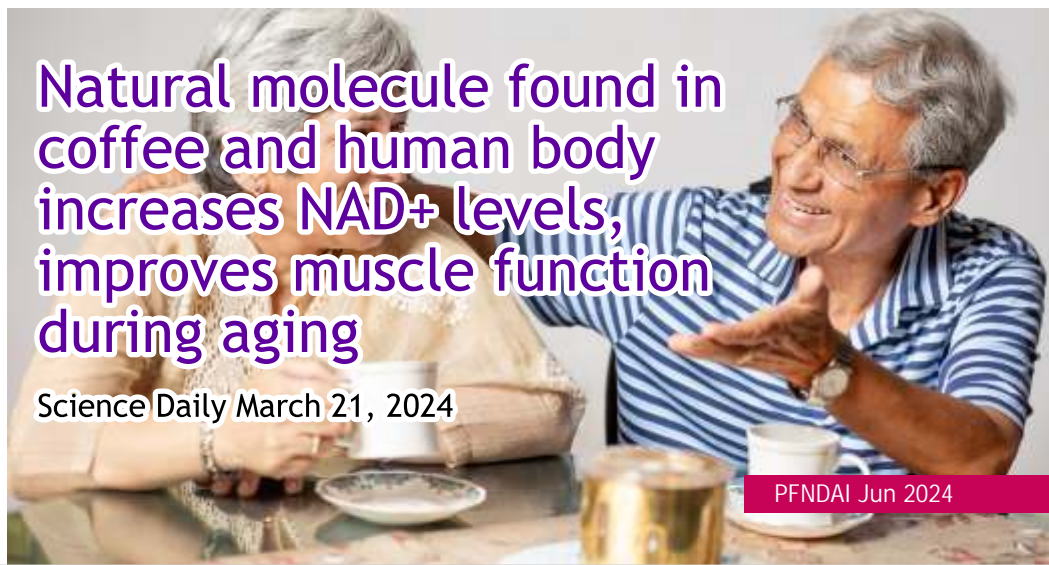
In an international collaboration among the University of Southampton, University of Melbourne, University of Tehran, University of South Alabama, University of Toyama and University of Copenhagen, the work builds on a previous collaborative study that described novel mechanisms of human sarcopenia.

Sarcopenia is a debilitating condition that affects many older individuals and can greatly impact their quality of life. The decline in muscle mass and strength associated with sarcopenia can lead to increased risk of falls, fractures, and decreased ability to perform daily activities. It is crucial to find ways to combat this condition and preserve muscle health as we age.

The discovery of trigonelline as a potential NAD⁺ precursor and its ability to enhance

Natural molecule found in coffee and human body increases NAD⁺ levels, improves muscle function during aging

Science Daily March 21, 2024



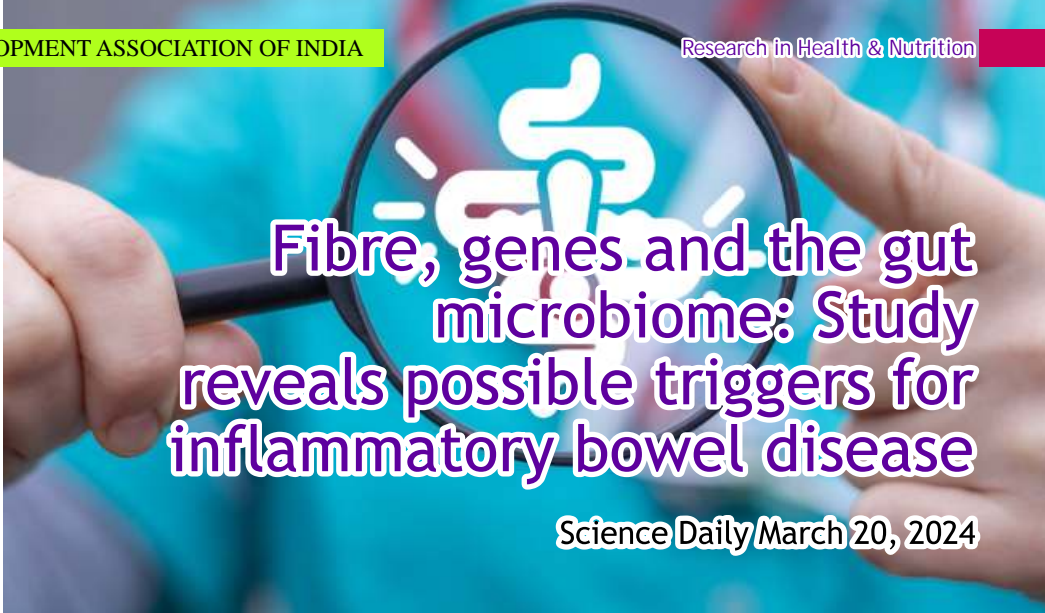
mitochondrial activity and maintain muscle function during ageing is a significant advancement in the field of healthy longevity research. By identifying the role of this natural molecule in cellular metabolism and its benefits on muscle health, there is hope for future interventions to combat sarcopenia and other age-related diseases. Through a combination of proper nutrition, physical activity, and potential supplementation with NAD⁺-producing vitamins, individuals may be able to maintain healthy muscles and improve their overall physical independence as they age.

<https://www.nature.com/articles/s42255-024-00997-x>

Abdominal pain, diarrhea, weight loss -- these and the other symptoms of inflammatory bowel disease (IBD) can be disruptive and debilitating.

And while scientists have figured out that IBD has a genetic component, not everyone with a family history develops the disease. To date, the environmental triggers for Crohn's disease and ulcerative colitis, known together as IBD, remain largely unknown.

The study's findings highlight the intricate relationship between diet, genes, and gut microbiota in the development of inflammatory bowel disease (IBD). The research showed that a low fibre diet can lead to an increase in mucin degrading bacteria in the gut, which can trigger inflammation in individuals with genetic susceptibility to IBD. Conversely, a fibre-rich diet was found to prevent inflammation and even reverse the effects of mucous



Fibre, genes and the gut microbiome: Study reveals possible triggers for inflammatory bowel disease

Science Daily March 20, 2024

erosion on inflammation.


Interestingly, the study also found that exclusive enteral nutrition (EEN), a diet commonly used to treat IBD in children, can reduce inflammation despite lacking fibre. Further analysis revealed that the EEN diet resulted in elevated levels of the branched-chain fatty acid isobutyrate, which may have anti-inflammatory effects. This suggests that certain bacteria in the gut may produce beneficial metabolites in response to specific dietary interventions, offering a potential new avenue for treating IBD.

Moving forward, the researchers plan to explore how different diets and bacteria interact to improve therapies for paediatric IBD and investigate ways to potentially prevent or reverse the onset of these diseases by manipulating environmental

triggers. By understanding how diet influences gut microbiome function, they hope to develop targeted dietary interventions that can modulate bacterial communities in the gut and alleviate inflammation in individuals with IBD.

<https://doi.org/10.1016/j.cho.2024.03.001>

An analysis of over 20,000 U.S. adults found that people who limited their eating across less than 8 hours per day, a time-restricted eating plan, were more likely to die from cardiovascular disease compared to people who ate across 12-16 hours per day, according to preliminary research presented at the American Heart Association's Epidemiology and Prevention Lifestyle and Cardiometabolic Scientific Sessions March 2024, in Chicago.



8-hour time-restricted eating linked to a 91% higher risk of cardiovascular death

Science Daily March 20, 2024

The meeting offers the latest science on population-based health and wellness and implications for lifestyle.

Overall, while time-restricted eating has shown some positive effects on cardiometabolic health measures in previous research, this study raises concerns about its long-term impact on overall mortality and cardiovascular health.

It is important for individuals considering a time-restricted eating plan to be aware of the potential risks associated with a shorter eating window, especially those with existing heart conditions or cancer.

This study highlights the need for a personalized approach to dietary recommendations, taking into account an individual's health status and the latest scientific evidence.

Further research is needed to fully understand the relationship between time-restricted eating and overall health outcomes. In the meantime, individuals should consult with healthcare professionals before making significant changes to their diet, especially if they have underlying health conditions.

Time-restricted eating may have its benefits, but it is essential to consider the potential risks and make informed choices based on individual health needs and goals.

The study included a large and diverse group of participants in the U.S., with a relatively long follow-up period of up to 17 years. The demographics of the participants across gender and racial categories provide a comprehensive view of the

population studied, although the limitations of self-reported dietary information must be considered. The potential implications of time-restricted eating on cardiovascular health are significant, and future research may shed more light on the underlying biological mechanisms at play.

Gardner emphasized the importance of considering the nutrient quality of participants' diets and other potential confounding factors in the analysis of the study's findings.

A more detailed comparison of demographics and baseline characteristics across different time-restricted eating schedules could further enhance the understanding of the observed effects on cardiovascular outcomes.

Overall, while the study offers valuable insights into the potential risks and benefits of time-restricted eating, further research and analysis are needed to fully comprehend its impact on long-term health.

<https://newsroom.heart.org/news/8-hour-time-restricted-eating-linked-to-a-91-higher-risk-of-cardiovascular-death>

Polyphenols are powerful plant metabolites known for their antioxidant properties, offering potential health benefits and protection against various diseases. With over 8,000 identified varieties, these substances are found in plentiful amounts in various fruits, vegetables, tea, and coffee.

Besides adding colour and flavour to foods, polyphenols play a crucial role in promoting health and overall well-being. Despite their bitter and astringent taste, recent studies indicate that they may hold the key to a range of health benefits, including the prevention of cardiovascular diseases, neurodegenerative conditions, and age-related sensory decline. However, there are significant gaps in understanding how exactly they exert these beneficial effects, particularly in terms of their interactions with the body.

Prof. Osakabe's research sheds light on the intricate relationship between polyphenols and sensory receptors in the gastrointestinal tract, offering a unique perspective on how these bioactive compounds promote wellness.

Deciphering the role of bitter and astringent polyphenols in promoting well-being

Science Daily March 18, 2024



By delving into the mechanisms through which polyphenols interact with the body, the study opens up new avenues for exploring the therapeutic potential of these compounds in preventing chronic diseases.

The findings of this review underscore the importance of considering sensory nutrition in the development of health-promoting food products. With a focus on how polyphenols stimulate sensory receptors and metabolic pathways, researchers can now explore innovative ways to incorporate these compounds into functional beverages and snacks. Ultimately, this research has the potential to revolutionize dietary interventions and enhance overall well-being, paving the way for a new era of personalized nutrition aimed at optimizing human health. Prof. Osakabe's work serves as a catalyst for future studies in this exciting field, offering hope for a future where food can serve not only as nourishment but as a powerful tool for promoting homeostasis and preventing disease.

(<https://www.mdpi.com/2218-273X/14/2/234>)

Researchers have discovered a link between gut bacteria and the success of milk-allergy oral immunotherapy. The study found that *Bifidobacterium* -- a genus of beneficial bacteria in the gut -- was associated with a higher chance of successful treatment.

The finding may help in the development of more effective oral immunotherapies, perhaps by combining them with probiotic supplements. By understanding the role that gut bacteria play in successful oral



Gut bacteria important for overcoming milk allergy

Science Daily March 15, 2024

immunotherapy for milk allergy, researchers are hopeful that they can improve the treatment and help more children develop tolerance to milk. The findings from the study suggest that having a certain type of beneficial bacteria in the gut, such as *Bifidobacterium*, may increase the chances of successful treatment. This discovery opens up possibilities for developing new strategies to enhance the effectiveness of oral immunotherapy, such as introducing probiotic supplements that can help promote the growth of beneficial gut bacteria.

For children who suffer from severe cow's milk allergies, the prospect of being able to safely consume milk without fear of allergic reactions is life-changing. It is clear that more

research is needed to fully understand the mechanisms behind the relationship between gut bacteria and oral immunotherapy. With further investigation and development of new treatment approaches, it is hoped that more children with milk allergies can benefit from successful oral immunotherapy and lead healthier, happier lives. (<https://www.sciencedirect.com/science/article/pii/S1323893023001053?via%3Dihub>)

Adults who reported drinking two litres (about 67 ounces) or more of sugar- or artificially sweetened drinks per week had a higher risk of an irregular heart rhythm known as atrial fibrillation compared with adults who drank fewer such beverages, according to new research published today in *Circulation: Arrhythmia and*



Sweetened drinks linked to atrial fibrillation risk

Science Daily March 15, 2024

Electrophysiology, a peer-reviewed journal of the American Heart Association.

Consuming sweetened drinks has long been associated with negative health outcomes, such as Type 2 diabetes and obesity. This new study from the UK Biobank sheds light on a potential link between sugar- or artificially sweetened beverages and atrial fibrillation (AFib), a condition that can increase the risk of stroke. With the expected increase in AFib cases in the coming years, it is crucial to understand the impact of our dietary choices on heart health. The findings suggest that limiting or avoiding sweetened drinks, both sugar-sweetened and artificially sweetened, could potentially reduce the risk of developing AFib. This research highlights the importance of considering the impact of our beverage choices on overall health and underscores the need for further investigation into the potential health risks associated with sweetened drinks.

The study conducted by researchers also evaluated

whether a genetic susceptibility to AFib played a role in the association with sweetened beverages. The analysis revealed that the risk of AFib was elevated with the consumption of more than 2 litres of artificially sweetened drinks per week, regardless of genetic susceptibility. Despite the unclear mechanisms linking sweetened beverages and atrial fibrillation risk, possible explanations include insulin resistance and the body's response to different sweeteners such as sucralose, aspartame, saccharin, and acesulfame. The American Heart Association advises against prolonged consumption of low-calorie sweetened beverages by children, while recommending limited intake for adults as a replacement strategy for sugar-sweetened drinks. More research is needed to fully understand the health consequences of artificial sweeteners on heart disease and other health conditions, but in the meantime, water remains the best choice.

(<https://www.ahajournals.org/doi/10.1161/CIRCEP.123.012145>)

An inexpensive measure of obesity in children and adolescents that could replace body mass index (BMI) has been identified in a new study as waist circumference-to-height ratio.

This measure detected excess fat mass and distinguished fat mass from muscle mass in children and adolescents more accurately than BMI. The study was conducted in collaboration between the University of Bristol in the UK, the University of Exeter in the UK, and the University of Eastern Finland, and the results were published in *Pediatric Research*. This groundbreaking study sheds light on the limitations of using BMI alone to diagnose childhood and adolescent obesity. The findings suggest that waist circumference-to-height ratio may be a more accurate and cost-effective measure of excess fat in children. This could potentially revolutionize the way healthcare providers assess and manage childhood obesity, ultimately leading to more effective interventions and improved health outcomes for young populations.

The research conducted by Dr. Andrew Agbaje and his team highlights the importance of investing in alternative measures to accurately diagnose obesity in children. By utilizing waist circumference-to-height ratio as a supplement to BMI, healthcare providers can more precisely identify excess fat and tailor interventions accordingly. This study not only contributes valuable insights to the field of paediatric obesity, but also offers practical implications for clinical practice and public health policy. (<https://www.nature.com/articles/s41390-024-03112-8>)



Waist-to-height ratio detects fat obesity in children and adolescents significantly better than BMI

Science Daily March 5, 2024

The findings of the recent research from Ireland emphasize the critical importance of addressing physical health in order to improve psychological well-being. The study showed a strong correlation between a higher body mass index (BMI) and mental health challenges, particularly in middle-aged and older women.

These results highlight the need for targeted interventions that focus on weight management and promoting healthy diets to help prevent and alleviate depression.

The researchers suggest that improving diet quality, such as consuming fruits, vegetables, whole grains, and low-fat dairy foods while limiting sugar-sweetened foods, red meat, and added fats, can have a positive impact on mental health. By following a diet that is rich in nutrients and anti-inflammatory properties, individuals may not only maintain a healthy weight but also improve their overall well-being. It is crucial for healthcare professionals to consider the relationship between diet, weight, and mental health when developing prevention measures and interventions for individuals struggling with depression.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0299029>

Eating for happiness: Study connects women's diet quality with mental well-being

08 Mar 2024 Nutrition Insight



This groundbreaking research project represents a significant advancement in the field of nutrition and health, offering a novel approach to tracking eating behaviours in real-world settings.

The use of wearable technology such as the smartwatch and jawline sensor, provides researchers with an unparalleled level of insight into individuals' dietary habits, paving the way for more effective interventions aimed at improving overall health and well-being.

The interdisciplinary nature of the study, combining expertise in nutrition, behavioural statistics, and engineering, underscores the complexity of understanding and addressing eating behaviours.

By focusing on at-risk populations and cultural influences on dietary habits, the research team aims to develop tailored interventions that can help individuals manage their eating behaviour more effectively and ultimately improve their health outcomes.

As the study progresses through various phases, from controlled laboratory settings to real-world environments, the researchers are poised to unlock invaluable data that could revolutionize the way we approach nutrition and health.

By bridging the gap between lab research and everyday eating behaviours, this pioneering device has the potential to transform the field and make meaningful strides towards addressing the global epidemic of obesity and related health conditions.

<https://www.nutritioninsight.com/news/pioneering-the-next-leap-in-ai-powered-wearable-health-technology.html>



Pioneering the next leap in AI-powered wearable health technology

07 Mar 2024 Nutrition Insight

From awareness to action: Urgent need for DHA in maternal nutrition

6 March 2024 Nutrition Insight

By actively participating in events, symposiums, and advocacy campaigns like #EveryDayCounts, a crucial role is played in raising awareness about the critical need for DHA during pregnancy among healthcare professionals and expectant mothers.

Through these efforts, the company is ensuring that the latest scientific findings and expert clinical guidelines regarding DHA intake are shared and understood by key stakeholders in the healthcare and nutrition fields. By increasing awareness, the global challenge of preterm births is helped to address and emphasize the role of omega-3 supplementation in supporting full-term pregnancies.

The importance of adequate DHA intake during pregnancy cannot be overstated, especially considering the potential to prevent preterm and early preterm births and reduce the associated lifelong health implications for children. By offering high-potency DHA products that align with expert recommendations and are easy to incorporate into daily routines, moms-to-be are empowered to prioritize their

health and the health of their babies. Through sustainable and innovative solutions like the life's portfolio, derived from natural algae and offering superior sensory properties, maternal health is not only supported but also contributing to a healthier future for both individuals and the planet.

(<https://www.nutritioninsight.com/news/from-awareness-to-action-dsm-firmenich-spotlights-urgent-need-for-dha-in-maternal-nutrition.html>)

Incorporating mangos into the diets of women, especially those who are pregnant, lactating, or trying to conceive, can have significant benefits for both their health and the health of their unborn baby.

The research conducted by US researchers found that including mangos in their diets led to improved intakes of vital nutrients such as fibre, folate, and vitamins C and E, which are often lacking in the diets of pregnant women. This increase in nutrient intake is crucial for reducing the risk of pregnancy-related diseases and promoting overall health during pregnancy.

The study also found that women who included mangos in their diets had a 16% higher Healthy Eating Index score, indicating better overall diet quality compared to those who did not consume the fruit. These findings are important for addressing the micronutrient deficiencies that are common among women of reproductive age worldwide and can have serious health consequences for both mothers and their children.

By incorporating mangos into their diets, women can improve their nutrient intake and reduce the risk of complications during pregnancy, ultimately leading to better health outcomes for both themselves and their babies.

(<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10820848/pdf/nutrients-16-00303.pdf>)



Mangos contribute to improved nutrient intakes among mothers-to-be

Kirstin Knight,
Vitafoods Insights Feb 23, 2024

Understanding women's real needs presents a considerable commercial opportunity, particularly when it comes to sports and active nutrition.

In a recent series of sessions focused on women's health at the Sports and Active Nutrition Summit, experts emphasized the importance of catering to the specific needs of female consumers through health tracking technology, investment in female-specific data, and the development of solutions that offer measurable results. This shift in focus towards a more personalized approach signifies a monumental change in the industry's understanding of the female consumer.

Hélène Guillaume, the CEO of tech company Wild.Ai, spearheaded the discussions by highlighting the crucial need to synchronize female needs by harnessing the power of data science and wearable technology. Through her innovative mobile app, Guillaume aims to empower women to make informed decisions about their health and performance by providing customized solutions based on research conducted specifically for women.

The University of South Carolina's Assistant Professor, Katie Hirsh, underscored the urgent need for increased research and investment in women's sports to address the significant gap in knowledge surrounding female athletes' unique nutritional needs. By recognizing the impact of hormonal fluctuations on performance and well-being, Hirsh advocates for a more targeted approach to nutrition and supplementation to

Female fluctuations, cycles and stages key to sports nutrition market

By Asia Sherman 04-Mar-2024 - NutraIngredients

optimize women's athletic performance.

Susan Hazels Mitmesser, Chief Science Officer at Pharmavite, Rachel Jones, Senior Vice President at GNC, and other industry experts joined forces in a panel discussion to address the evolving landscape of female-focused products and the diverse needs of women across different life stages. By emphasizing the importance of accessible, science-based information and product development, the panel aimed to bridge the gap between consumer demand and the industry's current offerings, marking a pivotal moment in the journey towards meeting the needs of the modern female consumer.

<https://www.nutraingredients.com/Article/2024/03/04/female-fluctuations-cycles-and-stages-key-to-sports-nutrition-market?>

The relationship between energy availability (EA) and sleep quality in adolescent athletes is indeed an important area of research.

Energy Availability (EA) and Sleep Quality: The study investigated the association between EA and sleep using ambulatory polysomnography (PSG) in adolescent athletes. Low energy availability (LEA) has been linked to decreased sleep quality, but previous research results have been inconsistent. The study found a threshold of LEA at 23 kcal per kg fat-free mass (FFM) per day, below which sleep quality significantly deteriorated.

Importance for Athletes: The findings emphasize the importance of monitoring LEA's impact on sleep quality, especially during intense training periods.

Low energy availability linked to poor sleep quality in young athletes

By Nikki Hancocks 28-Feb-2024 - NutraIngredients

Sleep quality plays a crucial role in athletic performance, overall well-being, muscle repair, hormone regulation, cognitive function, and emotional stability.

Challenges Faced by Young Athletes: Inconsistent sleep schedules, insufficient duration, and poor sleep quality are common issues among team sports athletes, particularly younger ones. Many athletes fail to meet recommended dietary guidelines for their sport and activity level.

The study included 42 male adolescent rugby players. Participants underwent baseline assessments for anthropometric measurements and body composition. They used portable sleep devices during habituation night sleeping. A seven-day follow-up was conducted at their training centre and boarding school.

Nearly half of the participants (47.6%) were in LEA during intensive training (15 hours/week). The LEA group experienced more awakenings compared to the optimal energy availability (OEA) group. This suggests a direct relationship between EA and sleep quality.

The study acknowledged potential underestimation of energy expenditure using accelerometry. Future research could explore appetite sensation and hormonal markers to better understand the mechanisms at play.

([Nutrients 2024, 16\(5\), 609](https://doi.org/10.3390/nu16050609); <https://doi.org/10.3390/nu16050609>)



Microbiome composition associated with exercise performance: Study

By Olivia Brown
04-Mar-2024 - NutraIngredients

A new case-control study investigating the microbiomes of male athletes and non-athletes following maximal exercise reports significant associations between performance measures and composition.

The relationship between the gut microbiome and exercise performance is an area of growing interest, and this research sheds light on some intriguing connections.

The gut microbiome plays a crucial role in overall health, including immune regulation and metabolic processes. Exercise can impact the composition of the gut microbiome, potentially leading to positive health outcomes. Previous studies have suggested that certain microbial species are associated with better athletic performance.

The case-control study included 52 healthy, active men who were categorized into endurance, strength, and control groups. Researchers assessed the participants' faecal microbiome DNA composition before and after two exercise tests: a high-intensity Wingate test and the

Bruce Treadmill Test. Notable differences in microbial species were observed between the groups during these exercise tests. *Bifidobacterium longum* and *Bifidobacterium adolescentis* were strongly associated with VO₂max, a measure of aerobic fitness. Positive correlations were found between common short-chain fatty acid (SCFA) producers and maximal power during the Wingate test.

SCFAs, particularly butyrate, may serve as additional substrates for metabolism during endurance sports. Butyrate also has beneficial effects on skeletal tissues, which could contribute to improved exercise performance.

Overall, this study highlights the intricate interplay between exercise, gut microbiota, and athletic performance. As our understanding grows, personalized interventions targeting the gut microbiome may enhance physical fitness and overall health (<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0297858>)

Supplementation with the probiotic *L. bulgaricus* may not be helpful for losing weight, but it has the potential to decrease blood triglyceride levels, a new trial has reported.

Probiotic *L. bulgaricus* may not have a significant impact on weight loss, but it could play a crucial role in reducing blood triglyceride levels, as a recent trial has shown. Elevated levels of triglycerides are linked to metabolic syndrome, which includes obesity and abnormal lipid levels. In a placebo-controlled trial conducted on overweight participants, supplementation with *L. bulgaricus* did not lead to weight loss, but it resulted in a notable decrease in blood triglyceride levels.

The study also highlighted potential benefits for overweight individuals with high blood triglyceride levels, as supplementation with *L. bulgaricus* led to significant improvements in regulating triglycerides and lipid content in VLDL and HDL. While the probiotic did not induce weight loss, it had a positive effect on improving the lipoprotein lipid profile in overweight individuals. Overall, daily supplementation with *L. bulgaricus* could help in preventing diseases related to metabolic syndrome by reducing blood triglyceride levels. Further research is needed through larger-scale and longer-term trials to fully understand the effects of *L. bulgaricus* on various health criteria for optimal application.

([Metabolites 2024, 14\(2\), 129; https://doi.org/10.3390/metabo14020129](https://doi.org/10.3390/metabo14020129))

Probiotic *L. bulgaricus* may not help with weight loss but could decrease blood triglyceride levels - new trial

By Audrey Yow
13-Mar-2024 - NutraIngredients Asia

The study emphasizes the importance of fruit juice in providing essential nutrients such as vitamin C, potassium, and folate, which are crucial for overall health and well-being.

While concerns have been raised about the natural sugar content in fruit juice, the study found that it only contributes a small percentage of free sugar in people's diets compared to products with added sugars. This highlights the importance of focusing on reducing sugar intake from discretionary or foods that are not recommended in dietary guidelines, rather than demonizing fruit juice as a source of natural sugars.

The researchers also noted that many countries lack data on fruit juice consumption, making it

challenging to develop effective policies for promoting healthy diets. This underscores the need for more research and data collection to better understand how fruit juice fits into overall dietary patterns and how it can be included as part of a balanced and nutritious diet. Overall, the study suggests that 100% fruit juice can be a convenient and valuable source of essential nutrients, especially for those who may not meet the recommended fruit and vegetable intake.

(<https://www.cambridge.org/core/journals/nutrition-research-reviews/article/current-perspectives-and-challenges-in-the-estimation-of-fruit-juice-consumption-across-the-lifecycle-in-europe/1714B147DEFA2089C14F3929BF6E2B71#>)



Fruit juices found to support immunity without causing weight gain

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FOOD SCIENCE & INDUSTRY NEWS

For a healthy fruit snack, what would you choose?

Science Daily March 5, 2024

Next time you're packing lunch for your kid or reaching for a healthy afternoon bite, consider this: only three types of fruit snacks -- dried fruit, fruit puree and canned fruit with juice -- meet the latest recommendations for high-nutrition snacks set by federal dietary guidelines, according to research by University of Massachusetts Amherst food scientists.

Overall, the study conducted by UMass Amherst highlights the importance of choosing nutrient-dense fruit snacks as a way to increase fruit intake in a diet. With fresh fruit not always being the most convenient option for individuals, opting for dried fruit can provide a similar nutritional profile without the added sugar and artificial ingredients commonly found in other fruit snacks like gummies. By utilizing the NRF Index to analyse the nutrient quality of different fruit snack options, the researchers were able to identify areas for improvement, such as reducing added sugar content and increasing fibre content in certain categories like formed fruit and fruit-based bars.

Moving forward, the researchers suggest that reformulating fruit

snacks to decrease added sugar and enhance the sensory profile could lead to more nutritious options for consumers. By focusing on improving the nutritional quality of fruit snacks, individuals can make smarter snacking choices that contribute to their overall health and well-being. With further research and development in the fruit snack category, there is potential for creating more diverse and nutritious options that cater to consumer preferences while still providing essential nutrients for a balanced diet.

(<https://www.mdpi.com/2072-6643/16/2/292>)

As consumer interest in dietary supplements targeting cardiovascular and heart health continues to rise, industry experts emphasize the importance of innovation and

technological advancements in meeting the demands of a complex and multifactorial health issue.

Sarah Gonçalves from Univar Solutions highlights the growing trend of incorporating AI into the development of cardiovascular supplements, citing its ability to revolutionize the exploration of bioactives and provide personalized approaches to heart care. Ståle Søvting from GC Rieber VivoMega and Rob Brewster from Ingredients by Nature underline the need for comprehensive and innovative products to meet the evolving needs of consumers seeking solutions for heart wellness. Julie Lemahieu from Gnosis by Lesaffre emphasizes the importance of protective technology in maintaining the potency of bioactive ingredients in new delivery formats, particularly highlighting the benefits of Vitamin K2 in safeguarding the cardiovascular and protective measures in the development of cardiovascular supplements showcases the industry's commitment to delivering effective and efficient solutions for heart health.

In recent years, the demand for supplements that support cardiovascular and heart health has increased significantly. Alongside vitamin K, omega-3 is

Pioneering tech and natural innovations in the cardiovascular health space

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Industry highlights potential for new and traditional ingredients for joint health

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one of the most sought-after supplements for optimal function, as evidenced by numerous studies. GC Rieber has introduced a groundbreaking technology that objectively analyses the taste and smell of omega-3 oils, allowing for an improved sensory profile. Tri-Nutra's CEO Morris Zelkha emphasizes the importance of technology in ensuring the quality of supplemental oils, such as their *Nigella sativa* oil extracted through a cold press method. Meanwhile, Monteloeder's Jonathan Jones discusses the importance of innovative formulations in cardiovascular health supplements, highlighting the versatility and scientific evidence behind their proprietary solution. With a focus on holistic solutions that provide maximum value and benefits in a single daily dose, these companies are leading the way in creating high-quality supplements for cardiovascular and heart health.

<https://www.nutritioninsight.com/news/pioneering-tech-and-natural-innovations-in-the-cardiovascular-health-space.html>

As the demand for healthy aging products continues to grow, consumers are increasingly seeking out mobility products to support their joint health.

While the market has traditionally been dominated by animal-based ingredients, there is now a noticeable shift towards herbal solutions with scientific backing. Collagen ingredients are also garnering more attention in the joint health arena. Experts from PharmaLinea, PB Leiner, Lonza, and Nektium are at the forefront of discussing the latest product

offerings and ingredients in the joint health market. Maja Orešnik, the science and research director at PharmaLinea, notes that plant-based ingredients like curcumin and *Boswellia* are becoming increasingly popular among consumers. She also highlights the advancements in collagen ingredients, particularly UC-II, which acts as an anti-inflammatory signal in the body. Other upcoming ingredients in the mobility area include calcium fructo-borate and palmitoyl-ethanolamide (PEA), which offer anti-inflammatory, analgesic, and neuroprotective effects to support joint health. Overall, the joint health market is evolving to meet the growing demand for effective and innovative ingredients to promote healthy aging.

As the demand for plant-based ingredients for joint health grows, formulators face challenges when working with popular options like curcumin. One major issue highlighted by Orešnik is that curcumin causes discoloration in production lines, leading to difficulties in cleaning. Regulatory uncertainties surrounding the future development of curcumin

also pose a potential disruption in the market, especially with regards to its Novel Food status in the EU. On the other hand, the industry has been slow to incorporate protein ingredients for bone and joint health, despite the recognized link between protein consumption and joint health. Collagen, in particular, has seen significant growth in product launches with joint health claims, indicating a shift towards its use in not just supplements but also food and beverages. PB Leiner's ongoing collaboration with universities to conduct clinical studies on collagen peptides demonstrates the commitment to providing evidence-based solutions for bone and joint health. The latest research findings have shown promising results in reducing joint pain and improving overall well-being, showcasing the power of collagen in promoting joint health.

Emily Navarro of Lonza, recognizes the challenges in educating consumers about the benefits of different types of collagen for mobility and joint health. She emphasizes the importance of providing clear and scientifically backed information to consumers.

One way to overcome this challenge is through formulation and application innovations, such as developing nutraceuticals that offer multiple benefits in a convenient solution. On the other hand, Laura López of Nektium stresses the importance of scientific research and clinical studies to support the development of natural alternatives for joint health support. Their core joint health ingredient has been extensively studied for its anti-inflammatory and analgesic effects, making it a promising option for conditions such as arthritis. Nektium ensures the quality and efficacy of their extract through standardized levels of active compounds and rigorous safety checks. By focusing on research-backed ingredients and innovative formulations, companies like Lonza and Nektium are leading the way in providing effective solutions for mobility and joint health.

<https://www.nutritioninsight.com/news/joint-health-in-the-spotlight-industry-highlights-potential-for-new-and-traditional-ingredients.html>

The increase in global product launches featuring dairy-based proteins from 2022 to 2023 reflects a growing trend towards protein-rich products.

With nearly half of these launches utilizing milk protein, and whey protein following closely behind, it is evident that protein is a leading product claim. Valio, Kerry Dairy Ireland, and Ingredion are at the forefront of meeting consumer demand and product innovation in this space. Valio's focus on quality dietary proteins for the elderly and creating high-



Innovating dairy proteins: Spotlight on product developments and nutrition needs

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protein, lactose-free snacks, highlights the importance of meeting consumer preferences. Kerry Dairy Ireland notes the convenience and accessibility of high protein dairy products in supporting daily protein consumption. Both companies are dedicated to sustainable practices and product development to meet changing consumer needs. The future of dairy-based proteins looks promising as companies like Valio and Kerry continue to innovate and deliver high-quality products to the market.

Valio's Dr. Turpeinen explains that the hydrolysis of milk protein allows for the production of products suitable for a variety of consumer groups, with increasing evidence of the benefits of hydrolysed protein. She notes that protein hydrolysis enhances protein absorption, making it valuable for athletes and the elderly. Additionally, hydrolysed protein is easier on the digestive system, promoting gut comfort and allowing sensitive individuals to enjoy high-protein dairy products. In the realm of infant formulas, specific hydrolysis of cow's milk proteins not found in breast milk

aims to mimic breast milk more closely and cater to infants with special nutritional needs. The future of dairy proteins lies in innovation, with plant-based proteins rapidly improving to match the gold standard set by dairy proteins. Innovation in proteins derived via fermentation shows promise for functional and nutritional equivalence to animal proteins, with the added benefit of improved sustainability. The rise of plant-based dairy options reflects changing consumer preferences and the demand for better variety and innovation.

Consumers are seeking plant-based dairy products with added protein content, as well as considering factors like sustainability, taste, and texture when making purchasing decisions. Ingredion's focus on advancing plant-based dairy through innovation and addressing consumer preferences is crucial to meeting the growing demand for plant-based proteins.

<https://www.nutritioninsight.com/news/innovating-dairy-proteins-spotlight-on-product-developments-and-nutrition-needs.html>

As awareness of the health impacts of excessive sodium consumption continues to grow, the food manufacturing industry is under increasing pressure to offer healthier options without compromising on taste.

With consumers becoming more vigilant about their dietary choices, the demand for low or reduced sodium products is on the rise. This shift in consumer preferences has prompted companies like Corbion, Kerry, and Lallemand Bio-Ingredients to innovate and develop solutions that allow for sodium reduction without compromising flavour and texture.

By collaborating with the food industry and leveraging their expertise in ingredient solutions, these companies aim to address the challenges associated with sodium reduction in processed foods and snacks. From using potassium chloride as an alternative to sodium to incorporating yeast-based ingredients for flavour enhancement, each company is dedicated to offering innovative solutions that meet consumer expectations for healthier products.

The focus on sodium reduction not only aligns with global health

Spotlight on sodium: Food innovators embrace the challenge of balancing taste and health

13 March 2024 Nutrition Insight

guidelines set by the WHO but also presents an opportunity for food manufacturers to enhance their brand reputation and cater to an expanding market segment of health-conscious consumers.

(<https://www.nutritioninsight.com/news/spotlight-on-sodium-food-innovators-embrace-the-challenge-of-balancing-taste-and-health.html>)

Replacing animal protein foods with plant protein ones not only benefits individual health but also has a positive impact on the environment by reducing greenhouse gas emissions.

The latest research by McGill University and the London School of Hygiene and Tropical Medicine

highlights the importance of making small changes in the diet to achieve significant health and environmental outcomes. The study found that partially replacing red and processed meat with plant proteins could extend life expectancy and reduce the risk of chronic diseases.

On a global scale, consumer dietary choices play a crucial role in mitigating food system emissions and addressing the climate crisis. Lifestyle changes, such as increasing plant-based protein consumption and reducing red meat intake, can lead to co-benefits in nutrition, health, and sustainability.

By making simple substitutions in the diet, individuals can contribute to a healthier planet while improving their own well-being. It is essential for policymakers to consider these findings and provide guidance and support for individuals to adopt more sustainable dietary habits.

(<https://www.nature.com/articles/s43016-024-00925-y>)

Small plant-based changes in the diet can reduce the carbon footprint by 25%

5 March 2024 Nutrition Insight

Tackling texture of plant-based proteins with non-UPF discovery

By Donna Eastlake
07-Mar-2024 - Food Navigator

Cyanobacteria, also known as blue-green algae, have emerged as a promising solution for improving the texture of plant-based proteins.

Researchers from the University of Copenhagen have harnessed these non-toxic cyanobacteria to produce protein-rich foods with meat-like textures, offering a sustainable and minimally processed alternative.

Cyanobacteria can be genetically modified to produce a protein that naturally doesn't occur in these organisms. The protein self-organizes into tiny threads or nanofibers, which somewhat resemble meat fibres. Imagine using these fibrous strands in plant-based meat, cheese, or other foods to achieve the desired texture.

Unlike some plant-based alternatives that require resource-intensive processing, cyanobacteria grow through photosynthesis, similar to plants. They contain substantial amounts of protein and healthy polyunsaturated fatty acids. Professor Poul Erik Jensen, from the Department of Food Science, describes this breakthrough as "very promising" because it allows us to manipulate living organisms to create protein

threads.

Cyanobacteria can be sustainably grown using water, atmospheric CO₂, and solar rays. This makes them an environmentally friendly choice. If we can utilize the entire cyanobacterium in food production—not just the protein fibres—it will minimize the need for extensive processing.

Ultra-processed foods are associated with poor health outcomes and contribute significantly to greenhouse gas emissions. A planet-friendly, sustainable plant-based protein like cyanobacteria could address both health and environmental concerns. While the future of cyanobacteria-based proteins is promising, large-scale production remains a challenge. Researchers need to refine these organisms to produce more

protein fibres. Professor Jensen likens it to "hijacking" cyanobacteria, similar to how dairy cows produce copious amounts of milk for us. Although we won't achieve this goal overnight, progress is underway.

In the meantime, consider incorporating other plant-based protein sources into your meals. Lentils, black beans, and mashed beans can enhance nutrient content without the need for ultra-processing. Remember, small changes can make a big difference!

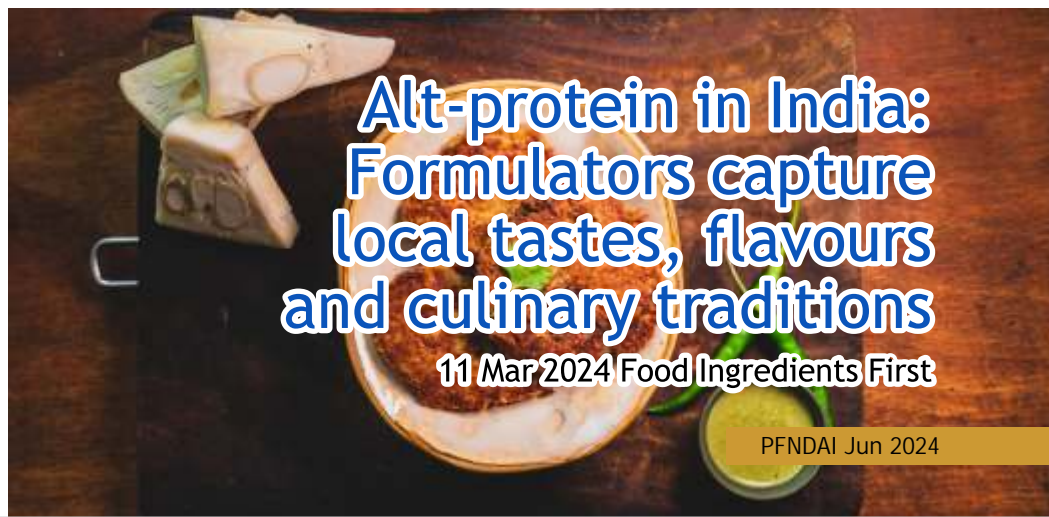
Key players in the industry are innovating to bridge the protein gap in India, where nearly 84% of vegetarian diets are said to be protein deficient.

They believe that plant-based protein could be the solution to this nationwide problem. The industry has seen an 11% increase in F&B launches with alternative protein in India between 2019–2023. To appeal to the Indian market, companies are "Indianizing" food to cater to the country's growing middle class who are willing to pay more for healthier options.

However, for alt-protein to become mainstream, it must become price comparable to their animal-protein counterparts, accessible for at-home familiar cuisine, and be a bigger

Alt-protein in India: Formulators capture local tastes, flavours and culinary traditions

11 Mar 2024 Food Ingredients First



part of foodservice menus. Companies are also focusing on capturing local tastes by adapting alt-protein products to local flavours and textures, allowing integration into existing diets and culinary traditions. This includes mimicking popular Indian dishes such as kebabs, tikka, and chicken curries, and creating a variety of product formats – from plant-based chicken nuggets and samosas, to plant-based biryanis, curries, and keemas. The industry is also leveraging foodservice, with over 500 standalone restaurants and hotels with plant-based menus in the top eight cities in India.

However, challenges remain in terms of recreating the right texture for alt-seafood and replicating traditional meat's "savory flavour and juicy texture". These challenges are being tackled with extensive R&D, ingredient selection, flavour enhancement, and texture optimization. Looking forward, while alt-meats in India are currently costlier than animal meat due to higher taxes and ingredient costs, the sector is expected to achieve price parity with conventional meat through techniques like precision fermentation and local production of proteins. As the category evolves, alt-protein brands in India will also reduce additives and enhancers. Moreover, India's diverse agricultural land is expected to drive export potential for plant-based meat alternatives from US\$278 million-US\$864 million in 2030.

(<https://www.foodingredientsfirst.com/news/alt-protein-in-india-formulators-capture-local-tastes-flavors-and-culinary-traditions.html>)



Banana prices to go up as temperatures rise, says expert

12 March 2024

By Matt McGrath, Environment correspondent

The article discusses the potential impact of climate change on the banana industry.

According to Pascal Liu, a senior economist at the UN's Food and Agriculture Organisation, climate change poses an "enormous threat" to banana supply, exacerbating the effects of rapidly spreading diseases. The UK, which imports around 5 billion bananas every year, recently experienced shortages due to sea storms. However, most consumers likely didn't notice this due to the country's effective supply chain management.

The article highlights that while the banana industry can handle short-term weather events, the long-term threats from global warming and the diseases it helps spread are a growing concern. One such disease is Fusarium Wilt TR4, a fungal infection that has spread from Australia and Asia to Africa and South America. This disease is particularly concerning as it is extremely difficult to eradicate once a plantation is infected.

In addition to these challenges, producers are also facing rising costs of fertilisers, energy, and transport, as well as difficulties in finding enough workers. These factors, combined with the impacts of climate change on supply, are likely to cause banana prices to increase and remain high in the coming years.

Consumers are increasingly seeking sustainably produced commodities, which for banana growers means not only making their production methods greener, but also paying for independent certification of their sustainability.

While these regulations can help producers make their systems more sustainable, they also come with additional costs for monitoring and control, which are likely to be passed on to consumers.

(https://www.bbc.com/news/science-environment-68534309?utm_medium=email&utm_source=rasa_io&utm_campaign=newsletter)

Healthy Hydrating

By Linda Milo Ohr, food Technology Magazine March 1, 2024

Functional Beverages are drinks that offer health benefits beyond their nutritional value.

They include ready-to-drink coffees, teas, rapid hydration beverages, and carbonated soft drinks. The fastest-growing categories are functional juice/water, protein beverages, isotonic drinks, vitamin-instant drinks, and coconut water.

Hydration: Beverages that claim to hydrate are popular, especially among younger consumers. Brands are now offering rapid hydration drinks with high levels of electrolytes, and there's a shift towards customized electrolyte solutions for specific needs like exercise and dehydration.

Sugar Reduction: There's a growing demand for beverages with reduced sugar content. Clean label sweeteners like monk fruit extract, stevia, and allulose are popular choices.

Prebiotics: Prebiotic fibre is increasingly being used in functional beverages for benefits like digestion, weight management, and satiety. Brands are stacking fibres and using a combination of fibres in low- or zero-sugar beverages to create a mouthfeel experience

that emulates sugar.

Mental Health and Cognition: There's a growing demand for ingredients that support mental health and cognitive performance. Adaptogens and nootropics are being used in a variety of beverage formats.

Non-alcoholic Drinks and Mocktails: Non-alcoholic drinks and mocktails are incorporating trends like hydration and sugar reduction. Brands are launching products to cater to the sober-curious demographic.

Future Trends: The functional beverage space is continually evolving with innovations in ready-to-drink coffees, carbonated soft drinks, and clean label energy claims. Brands are challenged to create beverages that address multiple needs while still delivering great taste. It's clear that the functional beverage industry is

dynamic and responsive to consumer needs and preferences, offering a wide range of products to support health and wellness goals.

(<https://www.ift.org/news-and-publications/food-technology-magazine/issues/2024/march/columns/nutraceuticals-healthy-hydrating>)

Hybrid creations that combine the best elements of two different foods are set to sweep the nation, according to ingredients manufacturer Macphie.

Brookies (Brownies/Cookies), fluffins (flapjack/muffins) and croons (croissants/doughnuts) are top of the menu as requests from restaurant and pub chain customers for hybrid-friendly recipes rose by 16% in the last quarter of 2023 alone.

When it came to savoury combinations, pizzadillas (pizza/quesadilla), sushirrito (sushi/burritos) and machos (macaroni cheese/nachos) were top contenders. Combinations of sweet and savoury - dubbed swavoury - are also on the rise, with the likes of avocado doughnuts and peach & honey Dutch babies.

Instagramable meals

According to Macphie, this growing trend for hybrid foods has been fuelled by consumers'

Hybrid food types set to sweep the nation

By Gwen Ridler
12-Mar-2024 - Food Manufacture



need for adventure and novelty in their diets, as well as to scratch the 'Instagram itch' for the 'self-proclaimed food photographer'.

Kirsty Matthews, brand manager at Macphie, said: "Food mashups and combinations have been key to reinventing menus for years but not quite in the way as we are starting to see now. Unorthodox combos like melon and ham or bacon and pancakes have become the norm and the hybrid food arena is starting to see much more creativity in combination at the cooking stage. It all comes back to satisfying consumer needs and more often than not, customers are increasingly being drawn to slightly quirkier combos - especially when it comes to sweet treats."

FOMO culture

Early marketing insights from the Aberdeenshire-based food manufacturer has highlighted that the hybrid trend could meet consumers need for innovation in a low-risk way while doubling down on a fear of missing out (FOMO) culture. "People want to experience new tastes but also have comfort foods they know and love and we're glad to be able to provide that balance," Matthews added. "We love being in the thick of such an exciting UK industry. "The food sector is obviously always evolving and challenging norms, which is why we love it. Our job is to give chefs and bakers the tools to be able to keep up with trends easily while still giving them the freedom to add their own twist."

(<https://www.foodmanufacture.co.uk/Article/2024/03/12/hybrid-food-types-set-to-sweep-the-nation>)

Dairy fuels better-for-you product innovation amid rising demand

18-Mar-2024 Food Navigator Asia

This commitment to sustainability aligns with the growing environmental awareness of consumers in Southeast Asia, who are increasingly seeking products that are not only beneficial for their own health, but also for the planet.

With a strong focus on health and wellness, consumers in the region are looking for food and beverage options that not only taste delicious but also align with their values of sustainability and responsibility towards the environment.

In conclusion, the shifting consumer lifestyles and rising health awareness in Southeast Asia are driving a significant transformation in the region's food and beverage industry. As the demand for healthier, more natural products continues to grow, dairy ingredients play a crucial role in meeting the diverse needs of consumers seeking better-for-you options. With their nutrient-rich profile,

and sensory advantages, dairy ingredients are well-positioned to help manufacturers in the region develop innovative, protein-boosted products that cater to the evolving preferences of consumers in Southeast Asia. Partnering with US dairy suppliers, who are at the forefront of innovation and sustainability, presents an opportunity for companies in the region to create products that not only meet consumer demand but also contribute to a healthier and more sustainable future.

(<https://www.foodnavigator-asia.com/Headlines/Promotional-Features/High-quality-dairy-proteins-fuel-better-for-you-product-innovation>)

With the rise of healthier eating habits and a growing emphasis on wellness, ice cream and frozen treat manufacturers are under increasing pressure to deliver products that not only taste great but also align with consumer demands for better-for-you options.

Scooping-up savings: How ice cream manufacturers are leveraging flavour science to tackle rising production costs

04-Mar-2024

In response to this, brands are turning to flavour science to innovate and adapt their products to meet these evolving consumer preferences.

One strategy that has emerged is the use of mimetic technology to reduce the reliance on edible oils in ice cream and dairy products, allowing manufacturers to maintain product quality and consistency while cutting costs.

Another approach involves creating 'newstalgic' flavours that combine classic comfort foods with unexpected ingredients, offering consumers a taste of nostalgia with a modern twist.

By leveraging the latest advancements in flavour matching and formulation, ice cream and frozen dessert brands can continue to delight consumers with indulgent treats that cater to their desire for both enjoyment and wellness.

<https://www.foodnavigator-usa.com/News/Promotional-Features/Ice-cream-manufacturers-can-use-flavor-technology-to-navigate-production-costs>

The brain health space is rapidly expanding with the introduction of innovative ingredients aimed at supporting cognitive function throughout all stages of life.

As consumers of all ages look to enhance their brain power, the market for cognition-boosting products is experiencing significant growth. From supplements to beverages, there is a wide range of options available to cater to different demographics and their specific needs. Companies like AB-Biotics, Fonterra, Friesland

Campina Ingredients, Gnosis by Lesaffre, and Pharmactive are at the forefront of this trend, developing cutting-edge products that target nutritional deficiencies and promote cognitive health. With a focus on using ingredients like probiotics, omega-3s, and other bioactive compounds, these companies are paving the way for a future where brain health is a top priority for consumers of all ages.

Gnosis by Lesaffre highlights the cognitive support benefits of its ingredient a fermentation-derived S-Adenosyl-L-methionine that supports the synthesis of key neurotransmitters essential for brain function. The company points out that SAME plays a crucial role in maintaining adequate levels of phosphatidyl-choline for memory and learning, combats free radicals as an antioxidant, and aids in DNA methylation for brain development and protection. FrieslandCampina Ingredients emphasizes the cognitive health benefits of its powders, enriched with DHA, an omega-3 fatty acid that has been shown to support cognitive function, particularly for individuals with mild cognitive impairment. AB-Biotics focuses on probiotics that impact the gut-brain axis, with products targeting stress, anxiety, memory, and cognitive function

by modulating the gut microbiota and neuroactive substance production. These innovative ingredients offer multifunctional benefits for cognitive health and overall well-being.

By incorporating probiotics and phospholipids into their daily routine, individuals can support not only their gut health but also their mental well-being. As research continues to explore the link between gut health and mood, consumers are turning to Nutiani's clinically tested probiotic solutions to address their major health concerns. With probiotic strains showing promising new clinical evidence for mood and mental health improvements, individuals can enhance their overall well-being. Additionally, the role of phospholipids in promoting cognitive function and mental well-being cannot be understated, making them a vital component in supporting brain health as individuals age. By understanding the importance of gut-brain axis communication and the benefits of probiotics and phospholipids, individuals can take proactive steps towards optimizing their mental and emotional health.

(<https://www.nutritioninsight.com/news/expanding-the-cognitive-support-space-with-innovative-ingredients-for-lifespan-support.html>)



Expanding the brain health space with innovative ingredients for lifespan support

28 Mar 2024 Nutrition Insight

With the growing awareness of the impact lifestyle choices have on heart health, consumers are increasingly seeking proactive and preventive measures to maintain cardiovascular wellness.

Nutraceuticals and dietary supplements are becoming popular choices for individuals looking to support their heart health and reduce the risk of cardiovascular diseases. Experts in the industry emphasize the importance of taking steps to protect heart health early on, rather than waiting for issues to arise and relying solely on pharmaceutical interventions.

Innovative solutions such as vitamin K2, omega-3 fatty acids, probiotics, polyphenols, and black seed oil are gaining traction as natural alternatives to traditional medications for heart health. These ingredients have been shown to have a positive impact on various aspects of cardiovascular wellness, including cholesterol levels, blood pressure, inflammation, and overall heart function.

Companies are developing unique formulations and delivery methods to make these heart-healthy ingredients more accessible and convenient for consumers of all ages and preferences.

As interest in preventive measures for heart health continues to grow, the focus on natural solutions and dietary supplements is expected to increase, paving the way for a more proactive approach to cardiovascular wellness.

Beyond medication: Exploring promising nutraceuticals for cardiovascular and heart health

21 Mar 2024 Nutrition Insight

(<https://www.nutritioninsight.com/news/beyond-medication-exploring-promising-nutraceuticals-for-cardiovascular-and-heart-health.html>)

Products formulated using pulses and beans, upcycled ingredients, and meat and dairy protein are among the trending alternative savoury snack options.

The rise of alternative savoury snacks, particularly those with health and sustainability benefits, has been a significant trend in the packaged snack industry in recent years. With brands like Hippeas, Uglies, and Bada Bean Bada Boom leading the way, consumers are increasingly seeking out snacks that not only taste good but also align with their values around health and the environment. The success of these brands has inspired both startups and established companies to innovate and develop new

products that cater to this growing demand.

As consumer interest in alternative snacks continues to grow, there is a clear opportunity for brands to differentiate themselves by offering functional ingredients, such as probiotics, adaptogens, and mood-boosting elements. This trend is reflected in the market data, which shows an increasing number of consumers willing to try alternative salty snacks with added health benefits. With the global savoury snacks category projected to grow significantly in the coming years, it is clear that the era of indulgent but unhealthy snacks is giving way to a new wave of better-for-you options that prioritize both taste and nutrition.

(<https://www.ift.org/news-and-publications/food-technology-magazine/issues/2024/march/features/a-better-for-you-crunch>)

A Better-for-You Crunch

By Carolyn Schierhorn
March 1, 2024 Food Technology Magazine

Can bright green 'super powders' really make you healthy?

3 March 2024 By Annabel Rackham, Health reporter, BBC

Companies selling super green supplements claim a scoop of their magic powder, mixed with water, is all you need to improve your health.

It's clear that while super green supplements may offer some benefits, experts like Tamsin Hill, a registered dietitian for the NHS, and Jenna Hope, registered nutritionist and author, suggest that a balanced diet is a more effective and affordable way to obtain necessary nutrients. Following points were made during discussions with them:

- Super green supplements, such as Athletic Greens and Rheel Superfoods, claim to offer numerous health benefits, including increased energy, clearer skin, and improved digestive health.
- However, experts argue that these claims are not backed by high-quality scientific evidence.
- These supplements are considered ultra-processed due to their complex manufacturing process.
- The cost of these supplements can be high, with daily costs ranging from £1 to £4.
- Experts suggest focusing on a balanced diet rich in fruits, vegetables, whole grains, and pulses as a more affordable and effective way to improve health.
- While these supplements are

not harmful and may help some individuals, they are not necessary for a healthy diet.

- Anyone considering taking a green supplement should first consult a dietitian or registered nutritionist.

It's important to remember that there's no one-size-fits-all approach to nutrition, and what works for one person may not work for another. As always, it's best to consult with a healthcare professional before starting any new dietary supplement regimen.

(https://www.bbc.com/news/health-68412650?utm_medium=email&utm_source=rasa_io&utm_campaign=newsletter)

Incredo Sugar G2 offers food manufacturers a unique and innovative solution to reducing sugar content in their products while maintaining the taste and sensory profile consumers expect.

By combining real sugar with a protein carrier, Incredo Sugar G2 delivers the sweetness of sugar more efficiently to taste buds, resulting in up to 50% less sugar required in recipes. This concentrated sugar-carrier complex is versatile and can be easily integrated into various applications such as baked goods, chocolates, spreads, and gummies, without any aftertaste or off-flavours.

In addition to its effectiveness in reducing sugar content, Incredo Sugar G2 also addresses sustainability concerns in food production. The concentrated solution allows for smaller quantities to be produced, stored, and manufactured, potentially reducing the environmental impact of sugar extraction over time. Incredo is committed to delivering innovative and sustainable solutions to the food industry. Its sugar-based sugar reduction technology was displayed at Natural Products Expo West in Anaheim, California. Benefits of Incredo Sugar and Incredo Sugar G2 could be seen through tasting samples, including caramels, gummies, and chocolate chip cookies made with this cutting-edge ingredient.

(<https://www.nutritioninsight.com/news/half-the-sugar-all-the-flavor-incredo-sugar-g2-poised-to-transform-sweetener-space.html>)

Half the sugar, all the flavour: Incredo Sugar G2 poised to transform sweetener space

5 March 2024 Nutrition Insight



The FDA's announcement of a qualified health claim for yogurt marks a significant milestone in recognizing the potential health benefits of this popular dairy product.

With type-2 diabetes being a major health concern in the US, the acknowledgment of yogurt's role in reducing the risk of developing this condition is a positive step towards promoting overall wellness.

The research cited in the petition submitted by Danone North America underscores the importance of making informed dietary choices and incorporating nutrient-rich foods like yogurt into daily consumption habits.

Amanda Blechman's emphasis on empowering consumers to take control of their health through nutritious food choices is commendable. By providing accessible and actionable information about the benefits of yogurt, Danone aims to help individuals make positive lifestyle changes that can contribute to a healthier future.

Beyond the link to type-2 diabetes, yogurt offers additional health advantages such as supporting bone and muscle health, as well as providing essential nutrients like calcium, vitamin D, and protein. With this FDA-approved health claim, the yogurt market in the US is poised for growth and innovation as more companies focus on highlighting the potential benefits of this versatile and nutritious food option.

(<https://bmcmedicine.biomedcentral.com/articles/10.1186/s12916-014-0215-1>)

REGULATORY NEWS

New FDA health claim linking yogurt to lower type 2 diabetes risk

7 March 2024 Nutrition Insight

The increasing controversy and uncertainty regarding alternative sweeteners have led to a decline in consumer trust. How should manufacturers navigate this complex landscape?

As the food industry continues to prioritize sugar reduction in response to health concerns, manufacturers must address the risks associated with excessive sugar consumption. What steps should be taken to ensure consumer safety?

Manufacturers and policymakers are not solely responsible for the

trend of sugar reduction; consumers are actively seeking low or no sugar options. How should the industry meet this demand while addressing confusion around alternative sweeteners?

In light of the World Health Organization's cautionary recommendations on non-sugar sweeteners and recent research findings on their potential health risks, the industry must adopt a strategic approach to address consumer confusion. How should industry leaders respond to these concerns?

Sweetener 'controversy' fuels consumer confusion: How should industry respond?

By Flora Southey
06-Mar-2024 - Food Navigator USA

FDA weighs application of new yogurt qualified health claims on sugary products

By Elizabeth Crawford
06-Mar-2024 - Food Navigator USA

Following a review of a petition submitted by Danone North America in 2018, the FDA has determined that there is limited evidence supporting a connection between yogurt consumption and a reduced risk of type 2 diabetes.

The agency emphasized that while the observational data does not establish a causal relationship or a specific mechanism of action, there is enough credible evidence to support the enforcement discretion of two qualified health claims accompanied by a disclaimer describing the scientific evidence level accurately.

Danone North America's research, which included data from 300,000 individuals showing a correlation between increased yogurt consumption and a lower risk of developing type 2 diabetes, has garnered support from the FDA for two qualified health claims. These claims suggest that consuming at least 2 cups (3 servings) of yogurt per week may reduce the risk of type 2 diabetes based on limited scientific evidence.

The FDA's recent decision to support qualified health claims linking yogurt consumption to a reduced risk of type 2 diabetes has been met with enthusiasm from health experts like Amanda

Blechman, who sees an opportunity to explore the untapped potential health benefits of yogurt. Blechman, a registered dietitian and director of health and scientific affairs at Danone North America, believes that promoting the consumption of yogurt can help individuals reduce their risk of diet-related diseases.

In response to concerns raised during a comment period on Danone North America's petition for qualified health claims, the FDA has taken into account stakeholders' worries about the added sugar content in yogurt. The agency has emphasized the need for cautious consideration of using these claims on yogurt products that may contribute significant amounts of added sugars to the diet, especially in a country where many people exceed recommended limits on added sugars.

(<https://www.fda.gov/media/176608/download?attachment>)

Food processing also helps reduce food waste, assists with

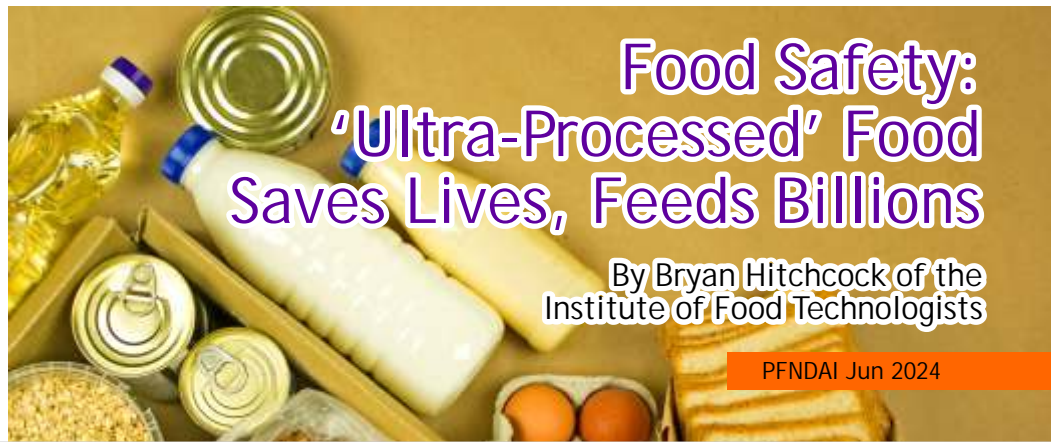
sustainability and ensures nutrient availability.

Despite the negative perception of processed foods, it is important to recognize the vital role that food processing plays in ensuring global food and nutrition security. The ability to process food has allowed for the delivery of safe and nutritious products to a larger population than ever before, helping to reduce food waste and extend shelf life. The Institute of Food Technologists highlights the importance of understanding the benefits of food processing and the need for up-to-date regulations to support the development and adoption of sustainable processing technologies.

As the global population continues to grow, the demand for safe and nutritious food will only increase, making it essential to invest in technologies that can improve food quality and sustainability. While there are challenges to overcome, such as regulatory approvals and cost optimization, public-private partnerships and investment in emerging technologies can help accelerate progress towards a more sustainable and secure food system. Implementing "Good Processing Practices" that prioritize sustainability and nutrition could further enhance the benefits of food processing and ensure a healthier future for all.

Food Safety: 'Ultra-Processed' Food Saves Lives, Feeds Billions

By Bryan Hitchcock of the
Institute of Food Technologists



Raising standard freezer temperature limit to cut energy use will not impact food safety

A groundbreaking study on frozen food storage temperatures has the potential to revolutionize the industry and significantly reduce carbon emissions.

By storing frozen products at -15°C instead of the standard -18°C , the company has found a way to cut energy consumption by 10–11% with no adverse effects on product quality. This innovative approach aligns with the growing need to address climate change in the food industry and demonstrates Nomad Foods' commitment to sustainability.

The results of the study have been met with enthusiasm from industry leaders, with the British Frozen Food Federation applauding the initiative as a significant step forward for the sector. The potential for reducing energy consumption and carbon emissions through a simple temperature adjustment is seen as a positive development that could benefit both businesses and the environment.

Nomad Foods' leadership in conducting this study and sharing the findings with the wider industry demonstrates a commitment to driving positive

change and promoting sustainability within the frozen food sector.

(<https://www.foodingredientsfirst.com/news/nomad-foods-raising-standard-freezer-temperature-limit-to-cut-energy-use-will-not-impact-food-safety.html>)

Climate change is a pressing issue that has the potential to not only impact the environment but also human health and food safety.

The effects of climate change on mycotoxin contamination in edible crops are becoming increasingly evident. Warmer temperatures are creating favourable conditions for the growth and proliferation of

mycotoxigenic fungi, leading to the increased occurrence of mycotoxins in food crops. Additionally, abiotic stress factors resulting from climate change are weakening the resistance of host crops, making them more susceptible to fungal disease outbreaks.

Research on the impact of climate change on mycotoxin contamination is crucial for developing effective strategies to mitigate the risks posed by these toxins. Future studies should focus on improving predictive modelling to better understand how climate change will affect mycotoxin production in different patho-systems.

By expanding research in this area and implementing proactive measures, we can work towards safeguarding food safety in the face of climate change challenges. It is essential for policymakers, researchers, and stakeholders to collaborate and take action to address the complex relationship between climate change and mycotoxin contamination to ensure the safety and security of our food supply.

(<https://doi.org/10.1111/1541-4337.13323>)



Changing climate, shifting mycotoxins:

Changing climate, shifting mycotoxins:
A comprehensive review of climate change impact on mycotoxin contamination

The Food Safety and Standards Authority of India (FSSAI) has ordered all manufacturing firms of fortified rice to integrate a new national traceability application into their operations in order to prevent adulteration of the final product.

The implementation of the Fortified Rice Traceability (FoRTrace) Application by FSSAI is seen as a major step towards ensuring the quality and effectiveness of fortified rice in India. By mandating the integration of this application into the operations of rice producers, the government is aiming to tackle issues of adulteration and false claims regarding fortification content. With the transparency and traceability provided by FoRTrace, it will become easier to monitor the production, raw materials, and sales of fortified rice, thus ensuring compliance with mandatory standards.

In addition to fortifying rice with iron, vitamin B9, and vitamin B12, India also mandates the fortification of other food staples such as wheat and salt. While fortification standards for other products like cereal, bakery items, and fruit juices exist, they are not yet compulsory. The focus on fortified rice as a key staple in public food distribution systems highlights the government's commitment to combating malnutrition and improving the overall health of the population. With the expansion of nationally-recognized laboratories for testing the micronutrient content of fortified rice, FSSAI is taking proactive steps to remove failed samples from the market and further ensure the safety and efficacy of fortified food products in the country.

Tracing rice fortification: India orders firms to adopt traceability application to prevent adulteration

By Pearly Neo 25-Mar-2024 - Food Navigator Asia

(<https://www.foodnavigator-asia.com/Article/2024/03/25/india-orders-firms-to-adopt-traceability-application-to-prevent-rice-adulteration>)

Long-awaited guidance from FDA on the safety of foods derived from gene-edited plants reiterates the agency's position that biotechnology is not inherently unsafe, but still encourages developers to voluntarily engage with the agency before going to market to ensure the food meets the same safety requirements as those from traditionally bred plants.

The FDA's final guidance on foods derived from plants produced using genome editing provides clarity on the agency's approach to regulating these products. By focusing on the characteristics of the food rather than the

method used to create it, the FDA is able to ensure the safety of these new plant varieties. The agency's New Plant Variety policy, originally established in 1992, has proven to be flexible enough to accommodate foods developed using a wide range of techniques.

One key aspect of the new guidance is the introduction of a second premarket notification pathway for foods from genetically engineered plants. This pathway allows developers to choose between a premarket meeting or a premarket consultation depending on the extent of safety risks associated with the GE plant. For higher risk foods and GE plants, developers are required to engage in a voluntary premarket consultation, particularly in cases where modifications could

FDA guidance on foods derived from gene-edited plants 'doubles down' on view that safety hinges on the final product, not the production method

By Elizabeth Crawford 18-Mar-2024 - Food Navigator USA

have significant impacts on allergens, toxins, nutritional value, or the introduction of new genetic material. This proactive approach to ensuring the safety of these products demonstrates the FDA's commitment to protecting consumers while also promoting innovation in the food industry.

(<https://www.foodnavigator-usa.com/Article/2024/03/18/fda-guidance-on-foods-derived-from-gene-edited-plants-doubles-down-on-view-that-safety-hinges-on-the-final-product-not-the-production-method>)

As per the Food Safety and Standards Act, 2006, food business means any undertaking, whether for profit or not and whether public or private, carrying out any of the activities related to any stage of manufacture, processing, packaging, storage, transportation, distribution of food, import and includes food services, catering services, sale of food or food ingredients.

According to the Food Safety and Standards (Safe Food and Balanced Diets for Children in School) Regulations, 2020,



Safe Food and Balanced Diets for Children in School

Science Daily January 3, 2023

school meals include all food and beverages sold or supplied on the school campus through canteens, school mess, hostel kitchens, vending machines or any other method and include all meals served through midday meal kitchens and catered for students by the school.

The regulations further say that "school authority selling or catering school meals by itself on the school campus shall get registered as a food business operator" from the authority concerned under the provisions of the Act, rules or regulations made under it and ensure that the food is safe and balanced.

The study highlights the potential underreporting of *Yersinia enterocolitica* as a cause of foodborne disease in humans.

The research found that the bacteria are more commonly found on foods like chicken, pork, salmon, and leafy greens than previously thought. Additionally, the genetic analysis revealed similarities between the types of *Yersinia* found on foods and those isolated from humans, indicating a potential link between food contamination and human infection.

Yersinia enterocolitica can cause yersiniosis, a type of gastroenteritis that results in symptoms such as diarrhea, fever, stomach cramps, and vomiting. While yersiniosis cases are generally low, the number may be underestimated as not all cases are reported. The study also emphasizes the need for improved surveillance strategies to monitor *Yersinia enterocolitica* in both food and human samples to better understand its impact on human health.



Genomics reveals potential under-appreciated threat to food safety

22nd January 2024 Quadram Institute, U East Anglia, UK

Overall, the findings from this study suggest that *Yersinia enterocolitica* poses a potential risk to human health through contaminated foods, and further research and surveillance are necessary to ensure food safety and prevent the spread of infection.

(<https://quadram.ac.uk/genomics-reveals-underappreciated-threat-to-food-safety-yersinia-enterocolitica-yersinia-enterocolitica/>)

The new online portal by the UN Food and Agriculture Organization (FAO) is a crucial tool in addressing the global challenge of achieving healthy diets for all.

With comprehensive statistics on food availability, consumption, and dietary intake of key nutrients, policymakers and organizations now have the data needed to inform effective policies and programs.

By harmonizing food and nutrient statistics and making them publicly available, the FAO is leading the way in transforming agri-food systems towards providing nutritious and healthy food. This initiative is a significant step towards ensuring a healthier and more sustainable future for all.

This collaboration between FAO's various divisions has resulted in an online service that offers a comprehensive view of food and nutrition statistics globally. The availability data, based on supply utilization accounts, provides crucial information on food, energy and nutrient supply in 186 countries since 2010.



FAO launches new food and statistics portal featuring nutrient information beyond calories

08 Feb 2024 Nutrition Insight

The addition of carbohydrates, fibre, and various essential nutrients in the new portal fills a gap that previously existed in similar platforms. The inclusion of data on the consumption of various food groups and nutrients in different countries further enhances the understanding of dietary patterns and nutritional intake around the world.

Overall, this online service is a valuable tool for researchers, policymakers, and anyone interested in food and nutrition trends on a global scale.

This new portal serves as a crucial tool in promoting understanding and cooperation within the global food system to address issues of nutrition and

health outcomes.

By providing policymakers with access to important data on food and nutrient availability and intake, the portal aims to guide informed decision-making and policy development to promote healthy diets and combat food insecurity and malnutrition.

The portal's ability to highlight disparities in nutrition between different regions and socio-economic groups underscores the need for comprehensive and collaborative efforts to address these complex challenges.

Through its insights and data, the portal will play a key role in shaping global food policies and strategies to ensure a more sustainable and equitable food system for all.

This study highlights the importance of understanding public perception and support when implementing nudges in the marketing and sales of food to promote healthier dietary choices.

By making small changes, such as emphasizing low-calorie options or providing sugar-free alternatives, consumers can be guided towards making better choices without feeling like their freedom is being restricted. The key is to ensure that these nudges are seen as transparent and effective in promoting healthier choices, which will ultimately lead to greater public support and acceptance.

Policymakers and industry stakeholders should take these findings into account when developing strategies to improve public health through food marketing and sales.

The study published in BMC Public Health sheds light on public acceptance of popular food choice default nudges.

The survey conducted in Germany revealed that certain nudge scenarios, such as placing vegetarian dishes at the beginning of a menu, garnered more support than others.

Participants expressed a preference for nudges that increased transparency and made it easier to opt out if desired. These findings suggest that effective and acceptable nudges can improve public health outcomes while respecting individuals' freedom of choice.

The researchers advocate for



Smart food choice “nudges” promote public health

16 Feb 2024 Nutrition Insight

further exploration of the optimal design for nudges to ensure their effectiveness and acceptance by the public. Overall, the study highlights the potential of nudges as a cost-effective strategy for promoting healthier food choices.

<https://bmcpublihealth.biomedcentral.com/articles/10.1186/s12889-023-17127-z>

PlanetDairy has chosen to enter the market with hybrid dairy products as a means of reducing the carbon footprint associated with traditional dairy production.

By blending dairy and plant-based ingredients, the company

aims to offer consumers a more sustainable alternative to conventional dairy products. This approach is in line with the company's goal of making it easier for retailers and consumers to transition to environmentally friendly options.

The brand name Audu, derived from Norse mythology, reflects the company's commitment to creating dairy products that are both innovative and rooted in tradition. By combining dairy and plant proteins, PlanetDairy aims to bridge the gap between taste and sustainability in the cheese industry, offering consumers a unique and environmentally conscious option.



Eco-friendly by stealth? Why a hybrid dairy newcomer is avoiding ‘hybrid’ labelling

By Flora Southey
08-Mar-2024 - Food Navigator USA

By integrating dairy and plant-based proteins, PlanetDairy has developed a range of hybrid cheese products that address both taste and functionality concerns. Through strategic sourcing of ingredients and collaboration with industry partners, the company has created a proprietary technology to enhance the quality and shelf-life of these products, ensuring a positive consumer experience.

Despite the technical classification of its products as hybrid dairy, PlanetDairy has chosen not to emphasize this label in its marketing strategy. Instead, the company focuses on transparently presenting the blend of cheese and plant-based ingredients in a familiar and approachable manner.

By highlighting the environmental benefits of their products without compromising on taste or quality, PlanetDairy aims to create a comfortable and appealing option for consumers.

PFAS (per- and polyfluoroalkyl substances), also known as “forever chemicals, are a significant concern due to their environmental persistence and potential health impacts.

Professor Ali Ling’s research highlights the urgency of reducing PFAS production and use. The cost of removing PFAS from the environment is



astronomical, exceeding the global GDP, which underscores the importance of prevention over remediation.

Minnesota’s proactive approach in banning PFAS in various product categories is commendable and sets a precedent for other states and countries. However, the ubiquity of PFAS in everyday products presents a significant challenge.

The development of alternative chemistries through green chemistry is a promising avenue for replacing PFAS in various applications.

However, it’s clear that a multidisciplinary approach involving policy changes, consumer behavior, and

scientific innovation is needed to tackle this issue effectively.

It’s also important to note that the health impacts of PFAS could be far-reaching, affecting not just the current population but also future generations. Therefore, swift and decisive action is crucial to mitigate the potential long-term effects of these chemicals.

This conversation underscores the complexity of the PFAS issue and the need for ongoing research and dialogue to address it. It’s a reminder of the critical role that science and policy play in protecting public health and the environment.

<https://doi.org/10.1016/j.scitotenv.2024.170647>