

PFNDAI

# FOOD, NUTRITION & SAFETY MAGAZINE

BULLETIN OCT 2024

## ROLE OF FOOD PROCESSING IN BUILDING SUSTAINABLE AND NUTRITIOUS DIETS

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THE GOOD OF  
MATERNAL  
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# PROCESSED FOODS ARE HERE TO STAY

Some activists trying to make themselves popular, are portraying the food industry as the cause of all the health problems of the population using half-baked knowledge (limited by their knowledge gained from social media posts) and even misinformation. They are using social media to spread it as people read sensational information and spread it quickly without verifying. As Mark Twain put it nicely "A lie can travel halfway around the world while the truth is still putting on its shoes."

Under such circumstances, it is difficult to create awareness when it lacks sensationalism. Thus, we all should first verify the facts. As claims need to be adequately validated, the harmful effects should be validated adequately before castigating any food product or process. We have already seen that dietary cholesterol was unfairly condemned for heart disease so even healthy individuals stopped eating eggs for fear of getting heart

problems. Now eggs are recommended in healthy diets.

Heating, drying and other processes, whether they are done in factories or at home will cause some undesirable effects on foods. We must not spread the misinformation that only industry causes these changes. These processes and ingredients or additives are used only when regulators found them to be safe. They all have certain functions useful for consumers.

Processing has served a critical role over decades to prevent food losses and wastes as well as to make them safe from microbial as well as natural toxins and antinutritional factors. Many grains cannot be easily consumed without processing and converting them into flour. Earlier it was done in home grinders but now in industry. Nutrients could also be conserved and degradation controlled by processing. Fortification needs processing. All these useful functions are ignored when we criticise processed foods.

We only look at fun foods which need to be consumed with control. For children, parents should exert controls. If there are excessive amounts being consumed of certain health foods, then marketing practices should be regulated without unfairly criticizing the food product itself.

There should be some rating system, traffic light, nutri-score, star rating etc. to indicate to consumers nutrient content or quality in addition to nutrition information. This will help consumers make choice and limit some products that contain high levels of fat, sugar and salt and low levels of essential nutrients including dietary fibre. If such a system is in place then consumers will have credible system to follow when they want to choose food products whether for sustenance or for fun. Ultimately one cannot deny them the choice.

We should avoid scaring people with complicated and unscientific systems of categorising. This would cause so much confusion among consumers that they would either ignore the system or totally avoid foods in a package. Both extremes are highly undesirable. Let us try to get the confidence of consumers and be transparent in communication relating to quality and safety of food products.

**Prof Jagadish Pai, Editor,  
PFNDAI**





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# ASSURING FOOD SAFETY IS A MEASURE, NOT A NARRATIVE.



AUTHOR

Dr Joseph I Lewis,  
Chairman, Regulatory Affairs,  
PFNDI

The effectiveness of government is how well an entrusted institution achieves the outcomes of the law. Protection is a way of keeping someone out of harm's way. Frequent news of raids and special drives reminds us that we are in harm's way.

From PFA days, the lament of rising adulteration, understaffing and lack of testing laboratories continue, forgetting that FSSA was meant to replace all that- for the better.

Not moving to its risk-based platform is inexplicable given that

predictive systems require less human resourcing with intelligent data, directing activities. Acting in the marketplace creates popular narratives of placing blame.

Soon, a storyline is generated that packaged foods affect health and safety. No one is asking if consumers are safer under FSSA than PFA.

There can be no answer as we are still PFA. However, everyone reads a good narrative, including policymakers.

One of the two pieces of data tells which system keeps consumers safe. In 2011 Delhi FDA placed collated analyst test results under 15 food groups on its portal. Failures are

classified as misbranding, substandard, unsafe and violations; the rest are declared genuine. In 50 months (2011-2016), 7406 samples were collected with nonstandard foods (proprietary) at 36-45% being the largest followed by dairy (~20%), edible oils (~13%) and cereals (~9%). The sampling was biased towards nonstandard foods. It remained routine, undirected and purposeless. It shifts when there is a public outcry like in the case of lead contamination.

However, the Delhi FDA did something good: it designed a system closer to FSSA by identifying hazards though it did not classify them by risk. At least two further steps were required, but it got the groundwork right. Of 7406 samples tested, 89% were authentic, a good measure of business compliance to standards.

CONT'D





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## CONT'D

In 2015, of 1680 samples, 3.4% were unsafe, with 50% failing due to exceedance in colour limits (100 ppm).

Declaring these as unsafe foods instead of substandard is a misinterpretation of science and law. These two data points give a more realistic picture of food safety than narratives.

Fourteen samples were tested for lead alerted by media reports. The average levels in noodle cake (0.68 ppm: limit 2.5) and spice packets (4.2 ppm: limit 2.5) were reported.

Apart from questioning the risk management decision arriving

at similar limits, a risk-based system would identify how a hazard like lead enters the supply chain and take steps to reduce it. This kind of data indicates how effective a food law is and the efficiency of its institution.



What followed was a standard on noodles and increased testing, overloading laboratories. Narratives, too,

follow facts but for a different output. A second data set shows where this focus is.

FSSAI published four Annual Reports, from 2014-15 to 2018-19, on sampling, failure type, penalty and prosecution. Testing samples increased from 60,548 (2014-15) to 1,06,459 (2018-19). The percentage of nonconformance rose from 20% to 29%, and penalties collected increased from Rs 10 to Rs 32 crore approximately.

Increased testing and finding more noncompliance is attributed to 'better enforcement targeting'.

This is neither the objective of the Act nor the assurance of food safety. States performing poorly attributed it to a shortage in staffing and test laboratories. Despite this, targets for 2019-20 were increased.

The narrative is of an unsolvable problem despite safer less burdensome intelligent risk-based solutions. Stakeholders play a major role in wanting a better food safety system promised by law.





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# ROLE OF FOOD PROCESSING IN BUILDING SUSTAINABLE AND NUTRITIOUS DIETS



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Food is central to human life and existence, serving multiple roles as a means of sustenance, nurturance, enjoyment, and as a catalyst for connecting with people. It is primarily drawn from natural sources, including agriculture, livestock, dairy, and others. Food processing involves the alteration or modification of foods from their harvested or raised state to clean, preserve, and enhance them, making them available for

consumption in various formats to meet different needs, consumer profiles, and occasions. Food processing encompasses procedures such as cleaning, milling, cutting, pasteurizing, blanching, cooking, canning, freezing, blending, dehydrating, roasting, packaging, and other methods that alter the food from its natural state, ensuring quality and making it appropriate for consumption. Additionally, food processing may involve the addition of other ingredients such as

flavors, nutrients, preservatives, and food additives or substances approved for use in food products.

India is among the top three food producers in the world, being the world's largest producer of milk, pulses, and jute. It also ranks as the second largest producer of rice, wheat, sugarcane, groundnut, vegetables, fruit, and cotton. India is also a leading producer of spices, fish, poultry, livestock, and plantation crops.

Currently, food wastage in India is high, and food processing plays a crucial role in increasing the shelf life of food, making it





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available and accessible throughout the year, and reducing food wastage. Despite the high scale of food production in India, there is significant scope to improve farmers' income by increasing value addition in food through various forms of enhancement, processing, quality improvement, and the use of technology. These efforts aim to bring stronger value propositions to consumers.

Dietary practices and habits play a major role in determining diets. In earlier times cooking was an important task especially in joint families. Food processing took place at home basis the availability of seasonal and indigenous ingredients e.g.- vegetable drying and fermenting to make pickles, squashes, jams, sherbets, making chips and papads, savory snacks etc. With urbanization and shift in lifestyles the approach to cooking changed. Increase in the number of nuclear families and faced-paced lifestyles have further altered the dynamics of home cooking. Increased income levels, exposure to newer cuisines, ingredients and travel have led have led people trying new

ingredients, global cuisines and international brands which has been made possible due to availability of these processed foods.

One of the most important functions of food processing is to ensure food safety by destroying harmful microorganisms. Processes such as pasteurizing milk, canning fruits and vegetables, and vacuum packing meats help prevent spoilage and increase food safety. Food processing can remove contaminants found in nature such as aflatoxins, which are harmful fungal secondary metabolites. Thus, food processing helps in extending the shelf life of certain foods, making them available across geographies.

Processing helps in breaking down the indigestible portion of food to make it edible and easy to consume and digest. Food processing also contributes to improving the bioavailability of certain bioactive elements present in food such as lycopene and destroying anti-nutritional factors present in many pulses and legumes.

Food processing makes it possible to fortify and enrich processed foods with

vitamins, minerals, protein and fiber to address population needs and positively impact nutrient deficiencies. It is through Universal salt iodization program that helped us make progress on 'Iodine deficiency disorders' in our country.

Fortification and targeted addition of nutrients provides nutritious and customized food products to consumers based on specific dietary needs. Specialized medical nutrition products also help people access important nutrients for healing, growth and development.

By design, some processed foods support dietary requirements and special nutrition requirements. For example, allergen free foods, such as those produced without gluten, support the dietary needs of people with sensitivities or allergies.

Processed foods such as sauces, seasoning mixes and other condiments are also known to enhance the taste and convenience of whole foods such as vegetables, pulses and whole grains.





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increasing food affordability, diversifying diets, and scaling up sustainable production practices. Processing helps build resilience into complex food

Processing foods help with improving sensorial attributes like taste & texture and provide variety and diversity to diets beyond cultural and traditional consumption patterns. Processed food also helps facilitate greater dietary diversity by providing access to items which are not available in certain geographies or in certain seasons.

Food processing is an essential element of food systems around the world and has the potential to positively impact the issues of nutrition insecurity and address the environmental challenges of nourishing the global population sustainably.

Processing can help food security by reducing losses of “ugly” or slightly damaged produce, increasing storability, and preserving critical nutrients, making improved nutrition accessible and affordable for more people.

It is a tool for curbing food and nutrient loss and waste,

systems. There is an opportunity today to channel and shape the future of processed foods, leveraging processing for its benefits.

The use of processed foods is the choice of the consumer, and Nutrition Facts Label and ingredients list can be useful tools in deciding when to include a particular food in one's diet. Emerging data shows a relation between excessive consumption of high calorie and low-nutrient dense foods and poor health outcomes, especially foods that contain added sugars, excess sodium, and unhealthful fats. However, there are processed foods that have low amounts of these ingredients while being fortified in beneficial nutrients such as calcium, protein, fiber, and vitamins B and D which may be difficult to obtain from everyday diets due to changing in dietary and lifestyle habits.

Hence, a combination of balanced diet, healthy lifestyle including physical activity and general

awareness around nutrition remain the key for a healthy and fulfilling lifestyle.

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# UNLEASHING THE GOOD OF MATERNAL NUTRITION

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According to World Health Organization 'Maternal health refers to the health of women during pregnancy, childbirth and the postnatal period.'

The developmental processes that span throughout these stages are associated with significant maternal changes in metabolism and physiology, both of which support the developing foetus and help to prepare the mother.

Each stage should be a positive experience, ensuring women and their babies reach their full potential for health and well-being.

Many women, are still unaware of how much their health and nutritional status

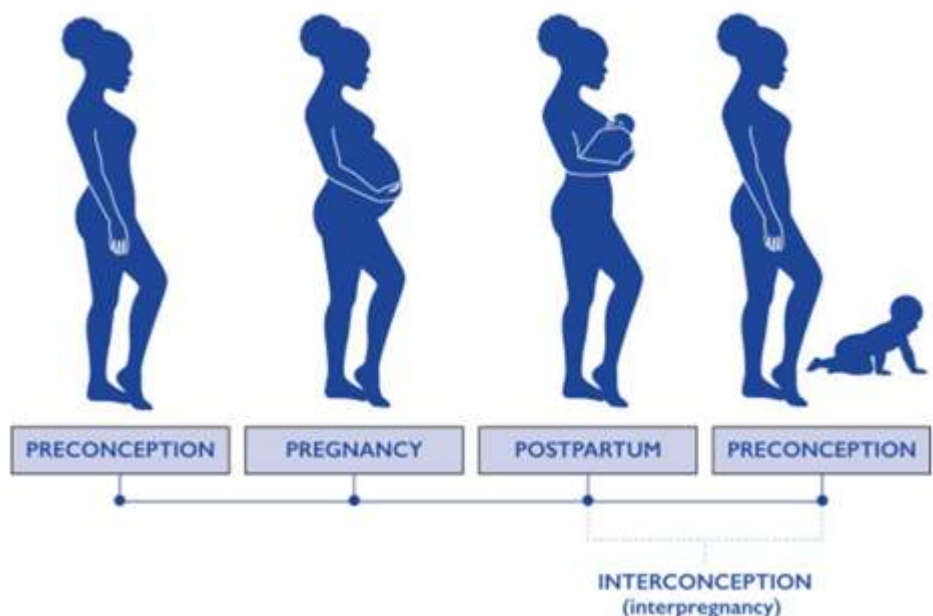
impacts their pregnancy outcomes, therefore improving health behaviours should begin during their earlier reproductive years.

## A. DECODING THE DEFINITIONS ACROSS MATERNAL LIFESTAGE

Figure 1 encompasses the

continuum of life course trajectory and emphasises on the stages beyond pregnancy and across maternal life-stages.

### PREGNANCY CONTINUUM AND INTERCONCEPTION CARE



The definition and role of nutrition in each phase is elaborated in Table below:

TERMINOLOGY	DEFINITION	ROLE OF NUTRITION
PRE-CONCEPTION	Before pregnancy, to promote the health and well-being of women, as well as to improve the pregnancy and child-health outcomes. Adolescence is a natural extension of the pre-pregnancy phase of the life-course continuum	Evidence on the importance of preconception nutritional status indicates a pressing need to ensure adequate and optimum nutritional intakes for all teenagers and women of reproductive age, especially those in lower socioeconomic groups. Waiting until a woman realizes she is pregnant is too late. Moreover, attention needs to be placed on the importance of healthy food and meals with an optimum nutritional content, to prevent both under- and overnutrition
ANTENATAL (PREGNANCY)	Period from when the woman misses her menstrual period or the uterus can be felt, to the onset of labour/ elective caesarean section or abortion.	Pregnancy requires a healthy diet that includes an adequate intake of energy, protein, vitamins, and minerals to meet maternal and foetal needs. Maternal undernutrition is highly prevalent and is recognized as a key determinant of poor perinatal outcomes. However, obesity and overweight are also associated with poor pregnancy outcomes and many women in a variety of settings gain excessive weight during pregnancy
POST - PARTUM	Duration from complete delivery of the placenta to 42 days after delivery.	Selected interventions and dietary advice can affect a woman's nutritional status, whether she is breastfeeding. Women's intake during postpartum should be increased to cover the energy cost of lactation. The three main vitamin or mineral nutritional deficiencies in the postpartum period are iodine, vitamin A and iron deficiency anaemia.
INTERCONCEPTION	The period between pregnancies or the first 24 months post-partum	The interconception periods offer crucial opportunities to intervene, to reduce possible long-term effects of suboptimal nutrition. Beneficial outcomes, such as improved weight management and nutritional intake, might be reached in a shorter timescale in the interconception period than in the preconception period



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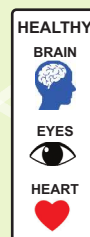
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Women's health, nutrition, and wellbeing across the continuum of preconception to pregnancy are critical for ensuring positive pregnancy and long-term outcomes for both the mother and child. Adequate nutrition during pre-pregnancy, pregnancy, and lactation is vital for good maternal health, as well as to support foetal growth and development. In this context, it is important to understand that the current approach "one-size-fits-all" may fail to improve maternal nutrition and overall nutritional status of women across maternal life-stages.

## B. MORE MAY NOT BE ALWAYS GOOD FOR MATERNAL NUTRITIONAL STATUS

Throughout the global dietary and nutrition recommendations, Malnutrition is referred to as poor nutrition in all its forms, from both deficient (energy and protein under-nutrition) or excessive (obesity) consumption of

macro-nutrients, to micro-nutrient malnutrition—which results from a diet with insufficient vitamin

and mineral density, poor bioavailability of nutrients, or increased body requirements due to infection or growth. A good diet is more than a matter of food quantity—quality is critical.

### 1. Revisiting Macronutrients – Case for Balanced Protein Energy Supplements (BEP)

It is beyond debate that Healthy diet made up of macronutrients in balanced proportions and a total energy intake sufficient to balance energy expenditure. Current evidence indicates that BEP supplementation (i.e., supplements in which protein provides less than 25% of the total energy content) improves foetal growth, and may reduce the risk of stillbirth, low-birth-weight infants and infants born small-for-gestational age, especially among undernourished pregnant women. High-protein supplementation during pregnancy does not appear to be beneficial and may be harmful to the foetus. The evidence further suggests

that antenatal nutritional advice with the aim of increasing maternal energy and protein intake may be effective in increasing maternal protein intake and reducing the risk of preterm birth.

### 2. Antenatal Multiple Micronutrient Supplements (MMS) poised to become standard care for maternal Nutrition.

The well-documented consequences of micronutrient deficiencies during this critical stage of life include impaired foetal growth (low birthweight [LBW], being born small for gestational age [SGA]), preterm birth, perinatal mortality, maternal and child cognitive impairment, premature rupture of membranes, insufficient gestational weight gain, and birth defects. Antenatal MMS provide a variety of vitamins and minerals to fill the gap between the typically low micronutrient intakes observed in low-resource settings and the higher requirements imposed by pregnancy. Various meta-analyses demonstrated that MMS containing iron and folic acid resulted in a consistent relative risk reduction for several outcomes, including LBW, SGA, preterm births, and stillbirths, over and above the benefits provided by iron and folic acid supplements (IFA).



MMS is a cost-effective intervention that brings additional benefits for the health of the mother, from improved micronutrient status to adequate gestational weight gain. Research and collective advocacy efforts have led to a policy framework – culminating in 2021 with inclusion of MMS in the WHO's Model List of Essential Medicines – that supports the introduction of MMS into antenatal care services as a critical intervention for pregnant women.

### C. PRACTICE RECOMMENDATIONS BEYOND DIETARY GUIDELINES ON MATERNAL NUTRITION



## 1. WHO recommendations on preconception, antenatal and postnatal care related to maternal nutrition.

### Policy brief, Preconception care: maximizing the gains for maternal and child health<sup>a</sup>

A preconception care package for women should include **information, education and counselling on nutrition, promotion of exercise, iron and folic acid supplementation, and energy- and nutrient-dense food supplementation.**

### Recommendations on antenatal care for a positive pregnancy<sup>a, b</sup>

**Counselling about healthy eating and keeping physically active** is recommended for pregnant women to stay healthy and to prevent excessive weight gain during pregnancy in all contexts. A healthy diet during pregnancy contains adequate energy, protein, vitamins and minerals, obtained through the consumption of a variety of locally available nutritious foods, including green and orange vegetables, meat, fish, beans, nuts, pasteurized dairy products, fruit and fortified foods. Counselling should be women-centred and delivered in a non-judgmental manner.

In undernourished populations,<sup>c</sup> **nutrition education on increasing daily energy and protein intake** is recommended to reduce the risk of low birthweight newborns, and **balanced energy and protein dietary supplementation** is recommended to reduce the risk of stillbirths and small-for-gestational-age newborns.

**Daily oral iron and folic acid supplementation** with 30–60 mg of elemental iron and 400 µg of folic acid is recommended in all contexts to prevent maternal anaemia, puerperal sepsis, low birthweight and preterm birth.

**Intermittent oral iron and folic acid supplementation** with 120 mg of elemental iron and 2800 µg of folic acid once weekly is recommended to improve maternal and neonatal outcomes if daily iron is not acceptable due to side-effects, and in populations with an anaemia prevalence among pregnant women of <20 per cent.

**Antenatal multiple micronutrient supplements that include iron and folic acid** are recommended in the context of rigorous research and during emergencies where access to nutritious foods is in jeopardy.

**Daily calcium supplementation** (1.5–2.0 g oral elemental calcium) is recommended to reduce the risk of pre-eclampsia in populations with low dietary calcium intake.

**Vitamin A supplementation** is only recommended to prevent night blindness in areas where vitamin A deficiency is a severe public health problem.

**Lowering daily caffeine intake** is recommended for pregnant women with high daily caffeine intake (>300 mg per day) to reduce the risk of pregnancy loss and low birthweight newborns.

### Recommendations on the postnatal care of the mother and newborn<sup>a</sup>

All women should be **counselled on nutrition** as part of postnatal care.

**Iron and folic acid supplementation** should be provided for at least three months postpartum.

## 2. Key content for nutritional counselling of women and adolescent girls during preconception, pregnancy, and postnatal care

	Preconception	Pregnancy	Postnatal
<b>Dietary intake</b>			
Healthy eating and physical activity to stay healthy, attain or maintain a healthy weight and/or prevent excessive weight gain	•	•	•
Increase daily energy and protein intake to increase BMI and/or reduce the risk of low birthweight infants in undernourished populations	•	•	•
Diverse diet, including locally available and affordable nutritious foods and fortified foods (iodized salt, fortified vegetable oil and fortified cereals)	•	•	•
Avoid drinking tea or coffee with meals and limit the amount of coffee during pregnancy in contexts where tea or coffee are a commonly consumed	•	•	•
Adequate rest and reducing heavy workloads		•	•
<b>Dietary supplementation</b>			
Continued and consistent use of IFA or multiple micronutrient supplements, including how to take supplements and manage side-effects	•	•	•
Continued and consistent use of calcium supplements in countries with low calcium intake, including how to take supplements and manage side-effects		•	
Continued and consistent use of balanced energy-protein supplements in undernourished populations	•	•	•

## 3. FIGO recommendations on adolescent, preconception, and maternal nutrition: Action points for healthcare providers.

Pre-pregnancy – adolescent girls		
Involved professionals	Assessment considerations	Discussion points
<ul style="list-style-type: none"> <li>School health educators</li> <li>Community health workers</li> <li>Nutritionists</li> <li>Family doctors (GPs)</li> <li>Ob-gyns</li> </ul>	<ul style="list-style-type: none"> <li>Diet composition</li> <li>Physical activity</li> <li>Height, weight, BMI</li> <li>Obesity risk               <ul style="list-style-type: none"> <li>Waist circumference + other anthropometric measures</li> </ul> </li> <li>Anemia</li> <li>Risk of specific nutritional problems (low nutrient density)               <ul style="list-style-type: none"> <li>Folate</li> <li>Iron</li> <li>Calcium</li> <li>Vitamin B12</li> <li>Vitamin D</li> <li>Iodine</li> <li>Zinc</li> <li>PUFAs</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Importance of a healthy diet and exercise</li> <li>Problems of sedentary behavior such as screen time<sup>a</sup></li> <li>Weight loss counselling</li> <li>Risky behaviors and exposures</li> <li>Pregnancy risk               <ul style="list-style-type: none"> <li>Contraception (timing and spacing) – encourage reversible methods such as IUD and implants that do not require regular action</li> <li>Folic acid supplementation 400 µg/day</li> <li>Encourage early pregnancy care</li> </ul> </li> <li>Local environmental issues (e.g. pollution, chemicals)</li> </ul>
Pre-pregnancy – when planning a pregnancy		
Involved professionals	Assessment considerations	Discussion points
<ul style="list-style-type: none"> <li>Community health workers</li> <li>Nutritionists</li> <li>Family doctors (GPs)</li> <li>Ob-gyns</li> <li>Midwives</li> </ul>	<ul style="list-style-type: none"> <li>Diet composition</li> <li>Physical activity history</li> <li>Height, weight, BMI</li> <li>Obesity risk               <ul style="list-style-type: none"> <li>Waist circumference + other anthropometric measures</li> </ul> </li> <li>Anemia</li> <li>Risk of specific nutritional problems (low nutrient density)               <ul style="list-style-type: none"> <li>Folate</li> <li>Iron</li> <li>Calcium</li> <li>Vitamin B12</li> <li>Vitamin D</li> <li>Iodine</li> <li>Zinc</li> <li>PUFAs</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Importance of a healthy diet and exercise</li> <li>Problems of sedentary behavior such as screen time</li> <li>Weight loss counselling</li> <li>Risky behaviors and exposures               <ul style="list-style-type: none"> <li>Tobacco, alcohol, recreational drugs</li> <li>Environmental toxins</li> </ul> </li> <li>Chronic disease screening and management</li> <li>Supplementation               <ul style="list-style-type: none"> <li>Folic acid supplementation 400 µg/day</li> <li>Other nutrients as required (iron, iodine, vitamin B12)</li> </ul> </li> </ul>
During pregnancy		
Involved professionals	Assessment considerations	Discussion points
<ul style="list-style-type: none"> <li>Community health workers</li> <li>Nutritionists</li> <li>Family doctors (GPs)</li> <li>Ob-gyns</li> <li>Midwives</li> </ul>	<ul style="list-style-type: none"> <li>Diet composition</li> <li>Physical activity</li> <li>Height, weight, BMI, waist circumference (other anthropometric measures?)</li> <li>Gestational weight gain</li> <li>Blood pressure</li> <li>Gestational diabetes risk</li> <li>Anemia</li> <li>Risk of specific nutritional problems (low nutrient density, deficiencies from specific diets or undernutrition)</li> </ul> <p><i>First trimester</i></p> <ul style="list-style-type: none"> <li>Folate</li> <li>Vitamin B12</li> <li>Iodine</li> <li>PUFAs</li> </ul> <p><i>Second and third trimesters</i></p> <ul style="list-style-type: none"> <li>Iron, iodine, zinc, copper, calcium</li> <li>Folate, B vitamins, vitamin D</li> <li>Energy (+450 kcal/day)</li> </ul>	<ul style="list-style-type: none"> <li>Dietary counselling</li> <li>Safe levels of exercise</li> <li>Sedentary time</li> <li>Weight management and gestational weight gain</li> <li>Risky behaviors and exposures               <ul style="list-style-type: none"> <li>Tobacco, alcohol, recreational drugs</li> <li>Sources of food-borne infection</li> <li>Environmental toxins</li> </ul> </li> <li>Pregnancy complication screening and management (GDM, blood pressure)</li> <li>Supplementation               <ul style="list-style-type: none"> <li>Folic acid supplementation 400 µg/day</li> <li>Iron supplementation 30–60 mg/day</li> <li>Other nutrients as required (iodine, vitamin B12, vitamin D)</li> </ul> </li> </ul>
Post-pregnancy (during lactation)		
Involved professionals	Assessment considerations	Discussion points
<ul style="list-style-type: none"> <li>Community health workers</li> <li>Nutritionists</li> <li>GPs</li> <li>Ob-gyns</li> <li>Midwives</li> <li>Pediatricians</li> <li>Lactation consultants</li> </ul>	<ul style="list-style-type: none"> <li>Diet composition</li> <li>Risk of specific nutritional problems (low nutrient density)               <ul style="list-style-type: none"> <li>Protein</li> <li>PUFAs</li> <li>Vitamins/minerals</li> </ul> </li> <li>Energy (additional intake as recommended by each country; approximately +330 kcal/day)</li> <li>Weight status and postpartum weight loss</li> <li>Screening for diabetes as appropriate</li> <li>Breastfeeding success</li> </ul>	<ul style="list-style-type: none"> <li>Healthy diet and physical activity, sedentary time</li> <li>Achieving a healthy weight</li> <li>Appropriate supplementation – iron and folic acid are recommended during first 3 months after delivery</li> <li>Breastfeeding support</li> <li>Nutritious weaning foods</li> <li>Interpregnancy spacing and contraception</li> <li>Chronic disease screening and management (type 2 diabetes, blood pressure)</li> </ul>

Abbreviations: IUD, intrauterine device; BMI, body mass index; GPs, general practitioners; PUFAs, polyunsaturated fatty acids; GDM, gestational diabetes mellitus.

<sup>a</sup> Time spent on computers, video games, and watching television.





## D. EMERGING TOOLS IN MATERNAL NUTRITION

### 1. Nutripedia

Preventive and promotive strategies for healthy early nutrition could involve developing online platforms that provide valuable information to parents, while also showcasing proven outcomes. However, studies reveal that approximately 60% of pregnancy-related nutrition web pages contain total or some inaccurate information. This misleading and inaccurate nutrition-related information, commonly referred to as “fake news,” needs to be displaced from reliable sources by accurate and scientific evidence-based online contents to inform on healthy eating practices. “Nutripedia-InformaTI per crescere” is a parent-oriented campaign to spread up-to-date nutritional knowledge, focusing on preconception, pregnancy, and early children life up to three years. Nutripedia provides the users with evidence-based scientific contents with an easy-to-access online platform. It consists of (i) a website, (ii) a social media page hosted on Facebook (FB), and (iii) “Nutripedia Chatbot,” a personalized advice app for IOS and Android. Without replacing the clinical interaction between parents and paediatricians, Nutripedia could be a supportive tool for health-

care professionals work by providing nutritional advice and real-time support for parents.

### 2. FIGO Nutrition Checklist

The FIGO Nutrition Checklist is an award-winning, validated clinical practice tool that identifies unbalanced diets during the preconception, pregnancy, and postpartum periods. A brief nutritional questionnaire, developed in 2015 by members of the FIGO Initiative on Adolescent, Preconception and Maternal Nutrition. It consists of four sections, with questions on specific dietary requirements, body mass index, diet quality and micronutrients. Food-based components of the FIGO Nutrition Checklist are based not just on Global Recommendation but also on dietary Guidelines for Indians. The checklist aims to facilitate conversations between healthcare providers and women on optimal dietary intakes.

The Checklist is available as a downloadable PDF in English and ten other languages. The online version is available in English, French and Spanish for health care providers to use around the globe.

### 3. mHealth Smarter Pregnancy

There is increasing evidence for a need for effective interventions to improve nutrition and other modifiable risk factors in

women who are contemplating pregnancy, particularly in the periconception period (i.e., the period 14 weeks prior to conception up to 10 weeks after conception). As most adverse reproductive outcomes originate during the periconception period, effective interventions targeting this period are needed. In this regard, lifestyle intervention Smarter Pregnancy was conceptualised. The program is based on 30 years of research on the influence of nutrition and lifestyle on reproduction and pregnancy course and outcome. The Smarter Pregnancy tool makes use of recent developments in electronic health (eHealth). Broad range of functions are available on mobile phones and handheld devices, with or without internet access, also known as mobile health (mHealth). Large scale trials with this application demonstrated that the use of this program improved the intake of vegetables (in particular) in women prior to conception and during early pregnancy. The follow-up results also suggest that this intervention had a positive effect on the continuation of healthier nutrition intake 12 weeks after stopping the intervention.



## E. LARGE SCALE INITIATIVES ON MATERNAL NUTRITION IN INDIA

**1. India's Poshan Tracker:** data-driven tool for maternal and child nutrition. The Government of India's 'Poshan Tracker' is the largest mobile phone-based nutrition surveillance system in the world. The application rolled out by the Ministry of Women and Child Development, Government of India on 1st March 2021 through National e-Governance Division (NeGD), as an important governance tool.

It provides transparent data on anthropometric outcomes, functioning of Anganwadi Centres (AWCs) and receipt of care services, namely the provision of supplementary food to pregnant women, children, and adolescent girls. While not a replacement for routine population-based surveys, real-time community-based monitoring such as the Poshan Tracker represents an unprecedented opportunity to evaluate the transformative potential of large-scale real-time nutrition monitoring.

## 2. DBT Programme Support for foetal Programming Research

This is a longitudinal study based on the Pune Maternal Nutrition Study (PMNS) and Pune Rural Intervention in Young Adolescents (PRIYA), to test the hypothesis that intervention with vitamin B12, multi micronutrients and protein in adolescent girls from before conception will favourably influence foetal programming of 'diabesity' in the offspring.

The results support the primary hypothesis that pre-conceptional B12 starting in adolescence achieved a better Vit.B12 and multi-micronutrient status in the offspring. An enviable biorepository spanning three generations in the PMNS study has been established, which is ready for multiple investigations in future.

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# COCOA SHORTAGE: CHALLENGES AND SOLUTIONS FOR THE CHOCOLATE INDUSTRY



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## Cocoa shortage and rising prices:

The value chain of the Cocoa industry starts with farmers growing Cacao trees and ends with billions of consumers enjoying chocolates and cocoa-based products worldwide(1). Because of the specific climatic conditions required to grow, cacao trees are grown in West African countries near the equator. The region contributes about 70% of global cocoa requirements. The major contributing countries are Ghana and Ivory Coast. The chocolate industry supports these countries' agricultural economies and employment.

Rising cocoa prices have been a major problem faced by chocolate manufacturers worldwide. One prediction published by Global Data (2) published in June 2024, is that total cocoa production for 2023 - 24 will drop by 11%. The strongest decline is expected in two major producing countries Ghana and Ivory Coast. The drop in production in the former to be 27% and later 20%. This drop is because of the drought, black pod disease, and the cocoa swollen chute virus that infected cocoa trees in 2023. Therefore, the industry has been facing availability and high price issues.

The current crisis of shortage and price is caused by the specific reasons mentioned. However, the environmental impact of Cacao plantations and

several other reasons will make the availability of Cocoa beans scarce and the costs are expected to go higher in the future. The environmental impact is throughout the value chain. This is from the extraction of raw materials and production of farming inputs to the industrial processing of cocoa beans into cocoa powder and cocoa butter. Other effects include greenhouse gas emissions from fossil fuels used to transport the beans to processing factories. The major damaging environmental concern for growing Cacao plantations is deforestation and its side effects. The cacao farmers clear tropical forests and plant new trees rather than using the same land. In the Ivory Coast, 70% of the illegal deforestation is related to cocoa farming.



# VITAMIN D KI TAAKAT





Deforestation affects biodiversity as the forests become unavailable to the animals. There are other issues like the use of child labour in growing, harvesting, and transporting cocoa beans. Because of UN Sustainable Improvement Goal 15, it is necessary to promote sustainable use of terrestrial ecosystems. All these factors will cause tremendous pressure on the availability and pricing of Cocoa beans. The situation for the chocolate industry will be more challenging as the demand for chocolates is expected to be two-fold by 2050(3). This will lead chocolate companies to be under pressure to procure sustainable cocoa supplies. Before ten years, many big companies pledged to limit deforestation in their supply chain by 2020. However, no company was able to manage to eliminate forest deforestation and the purchase of cocoa from intermediate suppliers makes it difficult to trace cocoa back to specific farms.

This multi-fold problem needs to have innovative solutions. One way is to grow the Cacao trees by

sustainable farming practices. Another solution could be using cellular agriculture techniques to grow cocoa in a lab. Both these solutions will give some relief. However, there is a limit to growing further even with sustainable farming practices because of the specific climatic conditions the plantation has limited the area where it is grown and the region for plantation being tropical the probability of fungal diseases to the crop will remain high. The efforts of growing Cocoa in the laboratory are in the nascent stage and it will take some time to go up to developing an acceptable product by use of ingredients obtained by these techniques at a large scale. The delay can be also because of challenges in developing a product to mimic the existing chocolates and regulatory hurdles. The best possible solution could be, to find the ways and means to reduce the use of Cocoa in products.

### Cell-based chocolates:

Cell-based chocolates are a novel method of making chocolate where instead of growing cocoa pods on farms, cocoa plant cells are grown in the lab. The process (4) uses advanced cellular agriculture

techniques. The cells are grown and replicated to produce differentiated cells that can be used to make various cocoa-based products including chocolate. In a typical process, a small sample of cells is obtained from the cacao tree. Then they are placed in an environment that can provide desired nutrients, temperature, and humidity favourable to the growth of the cells. The cells multiply to form a larger population in the growth media. The cells are guided to differentiate into specialised cells such as Cocoa butter or Cocoa solids. The differentiated cells are then extracted and used to develop the desired products.

An Israeli company (5) has been able to obtain Biomass from which cocoa butter is extracted and the leftover is cocoa powder. The cocoa butter obtained has the same chemical profile as traditional cocoa butter. The cost of this Cocoa butter is presently high and will take some more time to research. We have a similar issue with the high cost of cultured meat.







This is going to be a crucial factor. There will be regulatory hurdles for the introduction of products based on this technology. The combination of agritech, biotech, and AI together can help create optimum growing conditions for cells.

This technology can have better control over the final products as compared to the traditional method. Thus, high melting point cocoa butter can be possible so that it is suitable to be sold in warmer climate products. Similarly, less bitter cocoa powder can be made. The obvious advantage of this technique over the traditionally growing Cacao is it is less damaging to climate change. Four tons of cocoa pods are required to produce two tons of cocoa butter. That means using 200 trees and 100,000 square feet of land is required. In a lab, the same amount could be produced, using a 1000-litre bioreactor with 15 square feet of footprint. This is achieved without cutting a single tree. The cell-based chocolates will have another advantage over the traditional way.

In the traditional method, the Cocoa beans must be transported from the restricted area of agriculture in Africa to faraway places of manufacturing. In cell-based

chocolates, the bioreactors to produce ingredients could be placed in the vicinity of manufacturing plants saving logistical time and costs and environmental damage because of transportation.

### Cocoa-free Chocolates:

The sourcing of Cocoa beans is becoming a challenge for the Chocolate industry because of mainly environmental and ethical issues. Food scientists and Product innovators are constantly striving to meet this crisis. The best way to tackle this issue could be to develop a product that does not contain cocoa but mimics all the sensory characteristics of the chocolates. There are attempts to make such a product using a variety of other ingredients by replacing Cocoa. The major hurdle for such kinds of products will be regulatory challenges. As we have seen there was resistance to vegetable-based Ice creams to be called Ice cream which are now classified as frozen desserts.

Faba beans (6) are one such ingredient that can be used to replace cocoa beans to make a chocolate-like product. One of the key flavour components in chocolate comes from the seed protein found in Cocoa called "Vicilin." When the Vicilin is broken down

and the peptides are roasted it gives chocolatey flavours. The faba beans also contain "Vicilin." A UK-based company has developed a "bean to bar" process to recreate the same chocolatey flavour.

After controlled fermentation, the faba beans are dried, and roasted to get NUKOKO powder to be used in chocolate formulation by adding other ingredients. The product obtained will be cheaper than the conventional chocolates. Another German process uses Oats instead of Cocoa beans to make a product called Nocoa. The product uses Oats instead of Cocoa beans to recreate the characteristic chocolate flavour. This product contains 30% less sugar than traditional chocolates and does not contain theobromine when compared with traditional chocolates.





states (Kerala, Tamil Nadu, Andhra Pradesh and Karnataka) have scope for Cacao agriculture. The attempts to grow Cacao in India only started in the



Therefore, can be more nutritious than conventional chocolates. ChoViva (8) is a brand that uses a combination of Oats and sunflower seeds to make a product with a chocolatey flavour which is similar to that of traditional chocolate. If these products are successful with acceptance by consumers and the market grows for such products, it will have another positive fallout.

The cocoa-producing farmers may shift to producing these which will allow them for crop rotation and improve the fertility of the soil. The suggested way to improve consumer acceptance could be to gradually replace the Cocoa-based chocolates with cocoa-free chocolates.

1960s, when a private company, with the help of the World Bank, and Kerala Agricultural University took the initiative to launch cacao agriculture.

There has been a steady growth in Cacao agriculture, and presently India contributes only 1% of world production. The produce is consumed in the local production of chocolates and it is not sufficient to meet even local demand. Till 2015 - 16 India was importing 57% of its chocolate.

Recognition of the global market was achieved very recently. Asia's presence in the top 20 cacao-producing countries is only represented by Indonesia

and India. Indonesia is now among the top three producers in the world. The West African catastrophe in supplying cacao will help India consolidate its position on the supply side. The production has steadily increased in the last five years. From 25,783 metric tons (MT) in 2019 - 20, it has gone up to 29,792 Mt in 2023 -24. With an attractive market situation, the farmers are showing interest in cacao cultivation.

The Indian farmers have an advantage over the South African farmers where prices are controlled by the Government, whereas in India, they can sell it directly at the prevailing market price. Indian farmers are venturing into post-harvest processing with the help of many start-ups, which makes the crop more sustainable.

## Cocoa Production and India: (9), (10)

While we are discussing the global scenario, it is worth reviewing the cacao production situation in India. Considering the climatic conditions to grow Cacao, the four southern





There appears to be a situation where the Chocolate industry may face a crisis concerning the supply and pricing of cocoa beans. This is given because of factors like limited areas where Cacao can grow, the environmental impact of Cacao plantations because of issues like deforestation, and the increased demand for Cocoa-based products.



The food industry has responded positively and provided solutions like Cell-based chocolates Or Cacao-free chocolates. There will be a lot of work required to make the products to be made available on a large scale at a comparable price.

As these are a new class of products, anticipated issues will be regulatory hurdles as

they cannot be called chocolates, also there could be issues of consumer acceptance who are accustomed to eating conventional chocolates. It will take some time before such products on a large scale will be a reality.

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# HURDLES IN MAINTAINING BALANCED DIET AND ROLE OF NUTRITIONAL SUPPLEMENTS



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## Introduction

Healthy life is a consequence of what you eat and nutrition is a basic human need and a prerequisite for the same. From early stages of life a proper diet is absolutely essential for an overall growth and development and for leading an active healthy life. Food consumption pattern varies from geography to geography and depends largely on the production and distribution and which in turn defines the health

and nutritional status of that particular population (1). Food not only suppresses the hunger and satiety but also supplies nutrients, and a host of other components (non-nutrient phytochemicals) which have a positive impact on health. There has been a transformation that has happened across all industries including the food industry, the way it is produced, marketed or made available to the society has changed drastically in the last few decades (2). Currently there is a global nutrition crisis wherein approximately 3 billion people across the globe are suffering from low quality diets (3). Though there are many advances which has led to a more efficient food supply chains and in turn improvements in

food security and nutrition, yet malnutrition is still prevalent in many countries posing a challenge to our generation with unhealthy diet being one of the leading causes of death and disability (2). While in some parts of the world, there is no enough quantity of food to provide the required calories and nutrients for optimal growth, in others they are eating higher than required quantity of food for their health and well-being or simply foods high in sugar, salt and/ or fat (2). Over the next couple of decades, we will see various forms of malnutrition which might pose increasingly serious threats to the health and well-being of the population. Increase in population combined with the climate change will increase the stress on the





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food systems more so in countries in Africa and Asia. Combine this with the urbanization, we are staring at a situation where population will be affected by hunger and nutrition in a complex way both in positive and negative sense (3).

There has been a substantial progress in reducing hunger and undernutrition in the last couple of decades. The global hunger rates have seen a substantial fall and is now affecting around 10 % (4) and the chronically undernourished children has declined to one in four (5). This essential translates to lower mortality rates, lesser suffering and improved quality of life among families including children. Despite these gains, malnutrition does affect one third of the population worldwide way beyond people who experience hunger. Over next couple of decades we will experience (2):

- Prevalence rates of obesity and chronic diet related diseases including diabetes and hypertension are among the highest currently in every region especially in developing countries

- Stunting is becoming a phenomenon now. Nearly 25 % of all children under the age of 5 are stunted with both physical and mental capacities

diminished.

- More than 2 billion people lack vital micronutrients like iron, zinc, vitamins which might affect their health and life expectancy. Over half of the girls and young women don't meet their nutrient needs (2).

### Impact of Malnutrition

According to an estimate almost 45% of deaths of children under the age of 5 are linked to either under nutrition with suboptimal breastfeeding alone leading to 12 % of total deaths (6). One of the major causes of malnutrition is low quality diet. Diets that are not nutritious or safe is the number one risk factor for disease causation globally. Such low quality diets lack sufficient calories and have less of the micronutrients or have high calories and are rich in saturated fats, salt and sugar. In economic terms, across Africa and Asia, the estimated impact of undernutrition on gross domestic product (GDP) is 11% every year — more than the annual economic downturn caused by the global financial crisis of 2008-10.5 (7). Food systems are supposed to deliver health diets that satisfy the hunger and provide the

necessary nutrition for health and well-being. Today's food systems have a high focus on the quantity rather than the quality and hence they are not helping the consumers in making them healthy at a affordable cost.

### High quality diet

While there is no universal 'diet quality index', there is general agreement on what a healthy or high-quality diet should include, i.e. a diversity of foods that are safe and provide levels of energy appropriate to age, sex, disease status and physical activity as well as essential micronutrients. The World Health Organization's (WHO) definition of a healthy diet emphasizes the importance of starting healthy eating habits in early life (notably through breastfeeding) and limiting the intake of free sugars and salt.

It advises people to eat plenty of fruits and vegetables, wholegrains, fibre, nuts and seeds, while limiting free sugars, sugary snacks and beverages, processed meats and salt, and replacing saturated and industrial trans fats with unsaturated fats. In India, National Institute of nutrition has given a dietary guideline for what is a healthy diet and a how a plate should look with portion size (1).



## Current diet and nutrition scenario

Health and nutrition are the most important contributory factors for human resource development in the country. India has been classified by the World Bank as a country with a lower middle income, with per capita GNP of US \$ 996-3945 (8). It ranks 160th in terms of human development among 209 countries. Long-term malnutrition leads to stunting and wasting, non-communicable chronic diet related disorders, increased morbidity and mortality and reduced physical work output. It is a great economic loss to the country and undermines development. Protein Energy Malnutrition (PEM), micronutrient deficiencies such as vitamin A deficiency, Iron Deficiency - Anemia, Iodine Deficiency Disorders and vitamin B-complex deficiencies are the nutrition problems frequently encountered, particularly among the rural poor and urban slum communities (1).

Undernutrition starts as early as during conception.

Because of extensive maternal undernutrition (underweight, poor weight gain during pregnancy, nutritional anaemia and vitamin deficiencies), about 22% of the infants are born with low birth-weight as compared to less than 10% in the developed countries. Persistent undernutrition throughout the growing phase of childhood leads to stunting. About 33% of adult men and 36% of the women have a Body Mass Index (BMI) [Weight in kg/(Height in meter) (8) below 18.5, which indicates Chronic Energy Deficiency. In the case of vitamin A deficiency, 0.8- 1% of preschool children show the signs of Bitot's spots and night blindness (9).

## Indian diet actual vs requirement

As we all know, India is a very diverse country with diverse culture and food habits in line with their geography and culture. India has huge geographical heterogeneity in food consumption habits. The north has relatively higher intakes of wheat, sugar, oils, and dairy, but much lower intakes of fish, meat, and poultry than other regions. The south has higher intakes of

Hurdles in maintaining balanced diet and role of nutritional supplements



fish, poultry, rice, fruits, spices, and stimulants, but much lower intakes of roots and wheat. Diets in western states are relatively rich in oils, fats, and other grains (sorghum, millet, barley, maize), while the eastern states have higher intakes of roots and vegetables. The diet of the north-east region is characterized by higher meat and rice products and lower dairy and wheat products (10).

## Barriers in eating

- Time is gold: today the biggest challenge current generation faces is lack of time, because of the urbanization, disposable time available to individuals has reduced drastically and hence their food habits largely has deviated from being healthy to what is available
- Stress levels: Stress induced sugar craving is a known fact. With increased stress both at the work and at home has led to unhealthy eating habits both in terms of when and what is being eaten



- Nuclear Family: nuclear family has ensured that the tradition has not been passed, there is a believed to be reason behind what our ancestors followed. The tradition is lost and hence the eating healthy has also changed at large
- Globalization: Globalization has ensured that you get to eat any cuisine anywhere in the world and that need not necessarily be healthy.

Dietary guidelines

Dietary guidelines for India is given out the National Institute of Nutrition. In general dietary guidelines are a translation of scientific knowledge on nutrients (their dose and usage pattern) into a specific dietary advice for all the sections of the population. These guidelines are also generally defined as per the gender and age as required. They represent the recommended dietary

allowance of nutrients in terms of diets that are to be consumed by the population. It promotes the concept of diets adequately filled with nutrition and healthy lifestyle across age groups. These act as a guide for the general population directly as well as the health care professionals including nutritionists and dieticians and also the food business operators in formulating their products as per the recommendations. The guidelines can be considered as an integral component of the country's comprehensive plan to reach the goals specified in the National Nutrition Policy.

The major food issues of concern are insufficient/ imbalanced intake of foods/nutrients. The common nutritional problems of public health importance in India are low

birth weight, protein energy malnutrition in children, chronic energy deficiency in adults, micronutrient malnutrition and diet-related noncommunicable diseases. However, diseases at the either end of the spectrum of malnutrition (under and overnutrition) are important. The dietary guidelines emphasize promotion of health and prevention of disease, of all age groups with special focus on vulnerable segments of the population such as infants, children and adolescents, pregnant and lactating women and the elderly. Emphasis is on positive recommendations which can maximize protective effects through use of a variety of foods in tune with traditional habits. The fifteen guidelines prescribed, herein, stress on adequacy of intake of foods from all food groups for maintenance of optimal health Table 1.

Table 1: Dietary guidelines: Right nutritional behavior and dietary choices are needed to achieve dietary goals. The following 15 dietary guidelines provide a broad framework for appropriate action

Dietary guidelines

1. Eat variety of foods to ensure a balanced diet.
2. Ensure provision of extra food and healthcare to pregnant and lactating women.
3. Promote exclusive breastfeeding for six months and encourage breastfeeding till two years or as long as one can.
4. Feed home based semi solid foods to the infant after six months.
5. Ensure adequate and appropriate diets for children and adolescents, both in health and sickness.
6. Eat plenty of vegetables and fruits.
7. Ensure moderate use of edible oils and animal foods and very less use of ghee/ butter/ vanaspati.
8. Avoid overeating to prevent overweight and obesity.
9. Exercise regularly and be physically active to maintain ideal body weight.
10. Restrict salt intake to minimum.
11. Ensure the use of safe and clean foods.
12. Adopt right pre-cooking processes and appropriate cooking methods.
13. Drink plenty of water and take beverages in moderation.
14. Minimize the use of processed foods rich in salt, sugar and fats.
15. Include micronutrient-rich foods in the diets of elderly people to enable them to be fit and active.



## Nutritional supplements

When your regular diet is not healthy enough to provide you with the nutrition needs to keep you healthy and disease free, you will have to supplement the diet with nutritional supplements. Dietary supplements are products that are ingested in addition to the regular diet to provide additional health-promoting nutrients. According to the Dietary Supplement Health and Education Act (DSHEA), a dietary supplement is a product that is intended to supplement the diet; contains dietary ingredients including vitamins, minerals, amino acids, herbs, and botanicals; is intended to be ingested as a pill, capsule, tablet, or liquid; and is labelled as being a dietary supplement (11). These are widely used by the general population as OTC and are also recommended by the HCP's for any deficiency or to improve/ maintain overall health. Apart from general supplements, there are also specific supplements that claim to have benefits for specific disease or disorders like supplements for joint pain or weight loss etc. There are also specific supplements for women in particular which are intended to support bone integrity and prevent osteoporosis. Multivitamins and mineral supplements are one of the most

commonly used supplements while omega 3 and fish oil also are used. About a quarter of the supplements are used based on the advice of health-care providers (12) hence most of the supplements generally are self-prescribed.

Despite their popularity, the health benefits of dietary supplements are questionable. Lack of vitamins will certainly cause deficiency diseases such as scurvy, beriberi, pellagra, and rickets. However, the vitamin content of a normal well-balanced diet is sufficient to avoid these diseases. Studies aimed at determining effects of supplements often given conflicting results. There seems to be no current scientific consensus whether vitamins or any other dietary supplements prevent disease or have health benefits in well-nourished individuals (12).

## Supplement Formulations

Food supplements come in various packages, sizes and types, depending on how they are taken, when they are taken as well as the target population. There are tablets, capsules, powders, oral ampoules, effervescent tablets, chocolates and mastics which is available in syrup form. More specifically, food supplements can be taken in any of the following forms:



Hurdles in maintaining balanced diet and role of nutritional supplements

- oral pills or powders for relatively quick absorption;
- sublingual drops or oral disintegrated tablets, for ease of intake and to limit the damage of their active substance;
- nose spray or drops to further improve their absorption;
- injectables through intravenous and intramuscular injections for quick absorption and action;
- bone- anchored for slow and gradual absorption and prolonged action (American Diabetes Association ADA 2001)

## Things to remember

Scientists and health care professionals do agree and believe that under certain conditions, these supplements are beneficial for health and well-being of human but cannot or should not replace the balanced diet meals. There is a huge market potential for these. They are believed to be safe for every body but of course if they have active ingredients there will also be some one who might have some undesired effects or the other. Also there are combinations available which consumers might be unaware of and might take multiple products and cumulatively can exceed the upper limit.



More attention to adverse effects and potential interactions is needed to avoid serious medical outcomes. Users and physicians alike should consult updated literature before beginning or advising a regimen involving these substances. Medical providers should be aware that a large fraction of the general population takes dietary supplements. They should therefore request information from patients about their supplement intake to provide optimal medical care.

Self-prescription of dietary supplements should be avoided especially in older people, pregnant women, young persons and people living with disabilities should be informed and advised by their doctors or pharmacists on dietary supplementation

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# BRAHMI: A NATURAL BOOST FOR MIND & BODY

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In modern times like now, where every individual is constantly juggling duties, be it a student or an office-going adult, being mentally sharp and stress-free seems like a challenge. That's where the ancient Ayurvedic herb Brahmi (*Bacopa Monnieri*) becomes extremely useful. Brahmi, used for centuries in Ayurveda for its powerful effects on improving brain function, is becoming more well-known in the health community for its capacity to sleep better, ease stress, boost memory, and calm the mind (1).

Brahmi is a creeping herb native to wet tropical climates. It grows well in India, parts of Southeast Asia, and America and has tiny leaves and white flowers. Brahmi is categorized as a "medhyarasyana," or mind-rejuvenating herb, in Ayurveda. Its Sanskrit name, Brahmi, comes from the word "Brahman," which represents universal consciousness and highlights its connection to intelligence and mental clarity (2).

## What are its Active components:

Triterpenoid saponins found in the plant extract are believed to give *Bacopa monnieri* its therapeutic properties. The most important triterpenoid saponins present are 'Bacosides'. These bacosides

are found mainly in the leaves and stems of the plant. It has been shown that they support nerve impulse transmission and the repair of damaged neurons, both of which are essential for the development of healthy cognitive abilities like learning, memory, focus, attention span, and concentration. Bacosides also affect serotonin production and availability, which helps to maintain the balance of neurotransmitters.

But these active components of Brahmi might degrade over time or when exposed to specific environmental conditions



like: The bacosides and other antioxidants found in Brahmi can degrade with prolonged exposure to heat, high temperatures, and UV light. Moisture and oxygen exposure can also cause the product to deteriorate.

Maintaining its potency needs proper storage. When stored correctly (cold, dry, and dark), Brahmi powder usually lasts for one to two years. Tinctures can last up to three years if kept out of direct sunlight and heat since alcohol serves as a preservative.

### Medicinal Uses and Health Benefits of Brahmi:

- **Cognitive health-** One of the most recognised benefits of Brahmi is its capacity to stimulate the mind, particularly in terms of memory and concentration. To improve cognitive function, several of the chemical compounds in Brahmi stimulate the brain's cognitive ability (3). A study revealed, Brahmi reverses amnesia and can be used in the treatment of Alzheimer's Disease and Schizophrenia (4). As it can delay the onset of age-related cognitive diseases.

Studies have demonstrated that it is effective in promoting the formation of new neural connections and reducing oxidative stress in the brain, hence maintaining cognitive function well into old age (5).

In a short-randomized control experiment, it was shown that *Bacopa Monnieri* improves cognitive function. After taking one dose of Brahmi (320 mg), they saw a statistically significant increase in mood, cognitive function, and a reduced cortisol response to stress (6).

- **Epilepsy-** Brahmi leaves are a well-known natural treatment for epilepsy because of their neuroprotective and anti-epileptic qualities. It also possesses anticonvulsant properties which aids in the prevention of seizures. According to research, Brahmi regulates neurotransmitter activity in the brain and neural pathways, which could reduce the frequency and severity of seizures. Through modulating the levels of the inhibitory neurotransmitter gamma-aminobutyric acid (GABA),

Brahmi relaxes hyperactive neurons and lowers the risk of seizures. It aids in the prevention of mental illnesses including bipolar disorder and neuralgia in addition to epileptic fits (4).

- **Anti-inflammatory-Pro-inflammatory cytokines** are substances that may cause swelling, pain, and tissue damage and are responsible for initiating inflammation in the body. According to studies, Brahmi can prevent these cytokines from being released, which lowers inflammation. Given that neuroinflammation is connected to neurological disorders, anxiety, and cognitive loss, this is very advantageous for brain health.

When Brahmi plant leaves are applied topically to damaged areas of the body its compounds can reduce internal inflammation and reduce irritation and swelling. This is the best for those with gout, arthritis, and other inflammatory diseases. Creams, sprays and gels of Brahmi extracts are available for topical use.





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- **Anti-oxidant-Potent** antioxidants like Brahmi help the body in scavenging dangerous free radicals that can lead to oxidative stress and cell damage. Its high content of bioactive compounds, like bacosides, is essential in preventing oxidative damage to the brain and nervous system. Brahmi has demonstrated a particular resistance to acrylamide, a toxin that is highly harmful and linked to neurodegenerative illnesses. When consumed in any form, tea, leaves, or otherwise, Brahmi can give the immune system a necessary boost.

- **Heart health-Brahmi** is beneficial for heart health, mainly because of its anti-inflammatory, antioxidant, and stress-relieving properties. By increasing the synthesis of nitric oxide (NO), which relaxes blood vessels and promotes improved blood flow, it improves blood circulation. By lowering blood pressure, this vasodilation action could reduce the burden on the heart and minimize the risk of diseases including hypertension and atherosclerosis. By guarding

against oxidative stress, Brahmi helps maintain cardiovascular health by avoiding damage to heart tissues and blood vessels.

According to studies, the herb may help lower cholesterol levels, particularly triglycerides and LDL (bad cholesterol), which are important risk factors for heart disease. In addition, chronic stress is a known risk factor for heart problems, thus Brahmi's adaptogenic qualities, which support the body manage stress by controlling cortisol levels, are beneficial for heart health (7).

### Ways to Incorporate Brahmi:

- **Tea-** Brahmi tea can be brewed by steeping leaves rich in antioxidants or powder in hot water. It offers a mild, soothing effect that can help reduce anxiety and improve focus.
- **Powder-** One of the most convenient ways to use Brahmi is by using its powder. It is made from the dried leaves of the Brahmi plant. One can eat the powder with honey, ghee, or warm water or can be added to juices, smoothies, or even morning oatmeal. It's subtle, yet effective. Brahmi powder is believed to support the immune

system, reduce inflammation, and guard against chronic diseases when taken often. It is also recognized for enhancing digestion, helping the body eliminate toxins and promoting self-healing.

- **Capsules-** Another easy way to consume Brahmi is by having it in capsule or tablet form. These supplements are widely available in the market. It is often recommended to take Brahmi regularly under the supervision of a healthcare professional.

- **Brahmi oil-** It is prepared by boiling Brahmi along with other herbs in sesame oil or coconut oil. Massaging oil stimulates hair follicles and scalp relaxation, reduces mental fatigue, and stimulates hair growth.

### Common side effects & Contraindications:

Bacopa Monnieri is generally well-tolerated and has a high therapeutic index (A ratio that compares the blood concentration at which a drug becomes toxic and the concentration at which the drug is effective. The larger the therapeutic index, the safer the drug is). Gastrointestinal side effects, such as diarrhoea, nausea, and cramping in the abdomen, are the most typical. Bacopa has a slight sedative effect, which might be related to its anxiolytic properties.



Bacopa Monnieri is shown to inhibit acetylcholinesterase enzyme hence elevating acetylcholine in the body. As a result, Brahmi could counteract the effects of anticholinergic drugs and may worsen bradycardia and trigger conditions such as gastrointestinal obstruction, peptic ulcer disease, pulmonary conditions such as asthma, and chronic obstructive pulmonary disease or urogenital tract obstruction. Brahmi should be used cautiously (or avoided) in those with a thyroid condition or who take thyroid hormone medications as animal studies suggest that it may increase T4 (thyroxine) levels (1).

Brahmi and its commercial uses:

Brahmi extracts are used in functional food products,

supplements, and nutraceuticals to improve brain function and reduce stress.

According to Schedule 4 of FSSAI regulations (Health Supplements, Nutraceuticals, Food for Special Dietary Use, Food for Special Medical Purpose, Functional Food and Novel Food) Brahmi's permitted range allows the ingredient to be used in adult products at a daily dose of 1-2 g as an extract and 5-10 g as a powder from the whole plant.

For extracts, water and alcohol (often ethanol) are commonly used. Water-based Brahmi extract is usually used in Ayurveda to make decoctions or teas while Alcohol is commonly used for tinctures. Alcohol



helps extract both water-soluble and fat-soluble compounds and also acts as a preservative. Tinctures are more potent and concentrated compared to water-based decoctions.

Although Brahmi has traditionally been used in Ayurvedic medicine, its uses have expanded due to its growing popularity as a functional food ingredient. This well-known herb has a wide range of therapeutic uses and is utilized in several commercial products.

Other such examples are:

Product	Country of origin	Main Ingredients	Product Claims
Brahmi infused Ghee	India	Desi Cow Ghee cultured + Brahmi Herbal extract concoction	Rich in antioxidants, positive effect on Blood pressure, reduces stress & anxiety, beneficial for brain health, skin & hair.
Brahmi Infused Honey	India	Honey (97.5%), Brahmi (2.5%)	Anti-inflammatory and immune boosting.
Chyawanprash	India	Shankpushpi, Brahmi, Amla and other herbs.	Helps boost energy, concentration, immunity and strength.
Brahmi Granules	India	Mandukaparni, Ashwagandha, Brahmi, Shankpushpi and other herbs.	Active mind and energetic body.
Health Drink	India	Brahmi, Shankpushpi, Ashwagandha, Shatavari, Yashtimadhu.	Beneficial for physical growth and enhances memory

One such example is Brahmi-infused Ghee-Brahmi Ghrita, a classic Ayurvedic preparation, that involves infusing Brahmi into ghee. Ghee serves as a medium for the herb's fat-soluble constituents to be extracted. It is thought that this preparation will strengthen the nervous system and improve cognitive abilities. According to Ayurveda, ghee also serves as a carrier, helping to move the active ingredients of the herb further into the tissues.

Herbal plants are gaining more interest nowadays because of their various health benefits. Brahmi too is becoming more and more well-known in the food and beverage industries as an ingredient that promotes both physical and mental well-being due to rising consumer demand for natural, health-improving ingredients. The usage of herbs like Brahmi as a component in functional foods will revolutionize the market for these products

because of their huge capacity to improve consumers' health.

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# A1 AND A2 MILK: SOME BASIC UNDERSTANDING

AUTHORS



## Introduction

Milk is called nature's most nearly perfect and complete food. Milk has been the part of human diet across the civilizations for centuries throughout the world. Milk serves number of physiological functions, probably the most important of which are protective. Most of these functions are served by proteins and peptides (Fox, 2003).

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Milk is highly nutritious biological fluid which contains many vital nutrients like proteins, lactose, fats, vitamins and minerals (Table1). It also

contains many biological important compounds including, immunoglobulins, growth factors, cytokines, nucleotides, peptides, enzymes, etc.

**Table 1: General composition (g/100 mL) of milk from different Mammalian species**

PROPERTIES	SPECIES							
	Human	Cattle	Buffalo	Goat	Sheep	Camel	Horse	Donkey
Total solids	10.7-2.9	11.8-13.0	15.7-17.2	11.9-16.3	18.1-20.0	11.9-15.0	9.3-11.6	8.8-11.7
Protein	0.9-1.9	3.0-3.9	2.7-4.7	3.0-5.2	4.5-7.0	2.4-4.2	1.4-3.2	1.4-2.0
Fat	2.1-4.0	3.3-5.4	5.3-9.0	3.0-7.2	5.0-9.0	2.0-6.0	0.3-4.2	0.3-1.8
Lactose	6.3-7.0	4.4-5.6	3.2-4.9	3.2-5.0	4.1-5.9	3.5-5.1	5.6-7.2	5.8-7.4
Ash	0.2-0.3	0.7-0.8	0.8-0.9	0.7-0.9	0.8-1.0	0.69-0.9	0.3-0.5	0.3-0.5
Oligo-saccharides	0.50-0.80	0.003-0.006	No data	0.025-0.030	0.002-0.004	No data	No data	No data

Roy et al. (2020)

In a country like India, where sizable population is vegetarian, milk is significant source of nutrients like calcium, zinc, selenium, zinc, many B-complex vitamins. Milk is the only vitamin B12 and essential amino acids and fatty acids for vegetarian population. Milk contains high quality protein which is vital not only for nutritional but many known and unknown health benefits.

As per FSS Act, 2006, "Milk" means the normal mammary secretion derived from complete milking of healthy milch animal, without either addition thereto or

extraction therefrom, unless otherwise provided in these regulations and it shall be free from colostrum;

Further, it also defines, "Species identified milk" means milk as defined under the General Standard for Milk and Milk Products. The fat and SNF content of species identified milk specified under this regulation (namely buffalo milk, cow milk, goat milk, sheep milk and camel milk) shall conform to the respective composition given in sub-item (b) of item 2 and product may be subjected to pasteurization, boiling, sterilisation or Ultra

High Temperature sterilisation/treatment.

## Proteins

The word "protein" was coined by *Jöns Jakob Berzelius* in 1838. Milk proteins are one of the most extensively characterized proteins of several food proteins. Milk proteins are classified mainly into two categories casein and whey proteins (Table 2). Caseins are unique to milk, and as predominant proteins (along with a variety of whey proteins) they convey a large proportion of the amino acids that are required by the offspring.

Table 2: Milk protein (g/L) composition from different species

Protein fractions	SPECIES							
	Human	Cattle	Buffalo	Goat	Sheep	Camel	Horse	Donkey
Total casein	2.4-4.2	24.6-28	32-40	23.3-46.3	41.8-52.6	22.1-26.0	9.4-13.6	6.4-10.3
Total whey proteins	6.2-8.3	5.5-7.0	6.0	3.7-7.0	10.2-16.1	5.9-8.1	7.4-9.1	4.9-8.0
Major caseins								
$\alpha_{s1}$ -Casein	0.77	8-10.7	8.9	0-13.0	2.4-22.1	4.9-5.7	2.4	Present
$\alpha_{s2}$ -Casein	Absent	2.8-3.4	5.1	2.3-11.6	6.0	2.1-2.5	0.2	Present
$\beta$ -Casein	3.87	8.6-9.3	12.6-20.9	0-29.6	15.6-39.6	14.4-16.9	10.66	Present
$\kappa$ -Casein	0.14	2.3-3.3	4.1-5.4	2.8-13.4	3.2-12.23	0.8-0.9	0.24	Present
Major whey proteins								
$\beta$ -Lactoglobulin	Absent	3.2-3.3	3.9	1.5-5.0	6.5-13.5	Absent	2.55	3.3
$\alpha$ -Lactalbumin	1.9-3.4	1.2-1.3	1.4	0.7-2.3	1-1.9	0.8-3.5	2.37	1.9

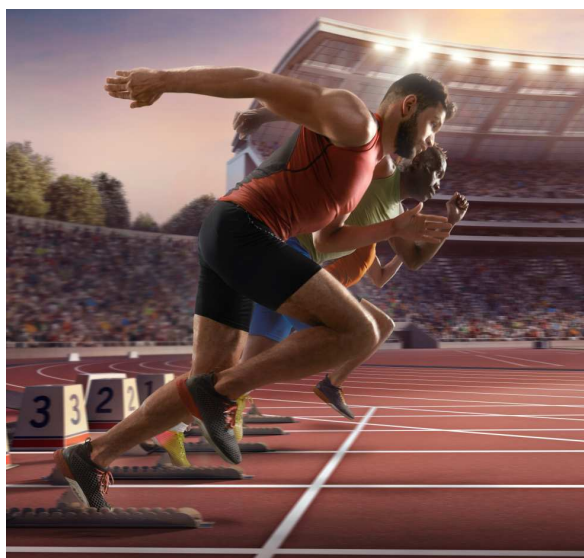
Roy et al. (2020)





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Bovine milk contains mainly 4 types of caseins, namely  $\alpha$ -s1,  $\alpha$ -s2,  $\beta$  and  $\kappa$  (Table 3). Milk also contains  $\gamma$ -caseins, a product of  $\beta$ -casein degradation. The most predominant caseins in both cow and buffalo milk is  $\alpha$ s1 followed by  $\beta$ ,  $\kappa$  and  $\alpha$ s2. The difference in these caseins has various technological, functional and nutritional consequences.

**Table 3: Proportions of various caseins in cow and buffalo milk**

Casein	Cow milk	Buffalo milk
$\alpha_{s1}$	39-46%	35-45%
$\alpha_{s2}$	8-11%	5-7%
$\beta$	25-35%	31-40%
$\kappa$	8-15%	10-12.5%

### What is meant by A1, A2 in respect of milk?

To understand what is meant by A1, A2 milk, one must know about genetic polymorphism of milk proteins which has been tabulated in Table 4. A combination of the Greek words, poly (meaning multiple) and morph (meaning form), this term is used in genetics to describe the multiple forms of a single gene that can exist in an individual or among a group of individuals. The genetic polymorphism of the protein do not alter the calorific value and nutritional value

**Table 4: Genetic polymorphism in milk proteins**

Casein	No.	Genetic variants
$\alpha_{s1}$ -Casein	8	A, B, C, D, E, F, G, H
$\alpha_{s2}$ -Casein	4	A, B, C, D
$\beta$ -Casein	12	A1, A2, A3, B, C, D, E, F, G, H1, H2, I
$\kappa$ -Casein	11	A, B, C, E, F1, F2, G1, G2, H, I, J
$\beta$ -Lactoglobulin	11	A, B, C, D, E, F, G, H, I, J, W
$\alpha$ -Lactalbumin	3	A, B, C

significantly, it affects few properties of protein. Genetic polymorphisms of bovine milk proteins can affect protein profile of the milk and, hence, certain technological, functional and certain health related properties (Petrat-Melin *et al.*, 2015).

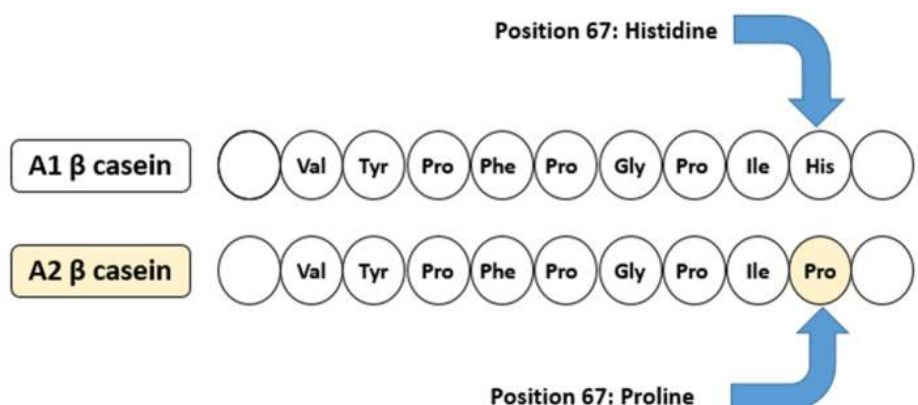
A1 and A2 milk are defined based on the genetic polymorphism, A1 and A2 are two genetic variants of the  $\beta$ -casein, which is the second most prevalent protein in milk after  $\alpha$ -caseins.  $\beta$ -casein has such 12 variants, A1 and A2 are two of them. A1 and A2  $\beta$ -casein only have a

single nucleotide difference in their genetic code, resulting in an altered amino acid base, leading to structural differences in the final protein which has been picturised in Fig. 1. A2  $\beta$ -casein is recognized as the original  $\beta$ -casein variant because it existed before a proline<sup>67</sup> to histidine<sup>67</sup> point mutation caused the appearance of A1  $\beta$ -casein in some European herds some 5000-10,000 years ago (Ng-Kwai-Hang and Grosclaude, 2003).

### Prevalence of A1, A2 $\beta$ -casein in various species milk

In western breeds  $\beta$ -casein

**Fig. 1: Difference between A1, A2  $\beta$ -casein**







A1 and A2 genetic variants occur at a much higher frequency than other genetic variants, while in Indian breeds of cows and buffalo milk variant A2 dominates.

North America and North Europe A1 frequency in Holstein Friesen (HF) breed cow is very high (>90%) but in German HF A2 frequency is high (97%). In other countries A1 frequency in HF ranges between (40-65%). In case of Guernsey breed from USA / Europe A2 frequency in cows and breeding bulls is very high (>98%) almost equal to Indian breeds. In case of Jersey A2 gene frequency is higher (60-80%) globally. Kerry breed from Ireland and Spotted breed from Hungary has A2 frequency above 75% (Samad, 2016). Most pure Indian breed's milk is having A2 type Kangayam, Nimari, Red Kandhari, Malnad Gidda, Kherigarh, Malvi Amritmahal, Kankrej, Gir, Sahiwal, Hariana, Tharparkar, Rathi, Mewati, Red Sindhi. Additionally, all the indigenous breeds of buffaloes, i.e. produces A2 type milk (Mishra et al., 2009).

Human  $\beta$ -casein has a

proline at the equivalent position in the sequence, suggesting that it is similar to A2 variant. The  $\beta$ -casein in camel milk seem to be more similar to the bovine milk A2 $\beta$ -casein variant. Both goat and sheep milk also contains A2 $\beta$ -casein variant.

### Digestion of protein

The nutritive value of bovine caseins is not only determined by their amino acid content but also by bioactive peptides which are released during in vivo, in vitro digestion or processing of milk. The digestion of milk protein releases many bioactive peptides having several activities like anti-diabetic, antibacterial, caseinophosphopeptide, immuno modulatory, etc. Milk protein opioid peptides derived from bovine casein and whey proteins are called casomorphins/casoxins and lactorphins, respectively (Kostyra et al., 2004).  $\beta$ -casomorphin-7 (BCM-7), is one such opioid peptide derived from the proteolysis of the  $\beta$ -casein variant A1. However, such opioid can be found in many milks and milk products (Haque et al., 2008), as well as various plant sources, including oats, wheat, rye, barley, and maize (Kaur et al., 2020).

### Health related issues with A1, A2 milk

The production of BCM-7 has

been attributed mostly to the A1 $\beta$ -casein genetic type rather than the A2 type (Brooke-Taylor et al., 2017; Jianqin et al., 2016). The substitution of histidine with proline at 67th position in case of A1 $\beta$ -casein affects the protein backbone and its consequent susceptibility to hydrolysis of the protein. Thus, relatively higher amount of BCM-7 is produced from A1  $\beta$ -casein than A2  $\beta$ -casein (Ho et al., 2014). Human  $\beta$ -casein has a proline at the equivalent position in the sequence, suggesting that BCM-7 is not released during the digestion of human milk. According to A1, A2 milk hypothesis, the A1 "like" components is proposed to be correlated with some incidence health complications. BCM-7 has been shown by various groups to have marked bioactivity, including immune modulation and opiate activity which are not sufficiently substantiated with human population.





## Recent Scientific Researchers' Opinion

The initial reports of the negative health implications of A1 milk were largely based on European epidemiological data. Consumers across the world are showing concern regarding consumption of A1 milk; however data are still not conclusive.

The role of  $\beta$ -casein and BCM-7 in the promotion of type 1 diabetes and other diseases is controversial, as indeed is the role of cow's milk and milk proteins. However, based on the current balance of scientific evidence, it is unlikely that  $\beta$ -casein or BCM-7 promotes the development of type 1 diabetes. It is also important to note that any cereal that contains gluten (including rye, wheat, and barley) is also capable of releasing exorphin peptides upon digestion. However, Beales et al. (2002) could not confirm that A1 $\beta$ -casein was more diabetogenic than A2 $\beta$ -casein in NOD mice; both  $\beta$ -casein variants were protective in BB rats and

NOD mice.

While some evidence suggests a link between A1 milk consumption and gastrointestinal discomfort, it

is likely that these effects pertain to a particular demographic of consumers. The exact mechanisms for these effects are still unclear. It is also worth noting that, in essence, the focus should not remain solely on A1 or A2 milk, as there are several variants that are capable of releasing the peptide of interest, BCM-7. While some individuals may choose to reduce or remove A1 milk from their diet as a precautionary measure, they should do so knowing there is substantial uncertainty about the evidence to support such an approach.

The topic has also been investigated by national food authorities to examine whether any evidence warranted a change in policy or further risk assessment relating to BCM-7. These include a report to the New Zealand Food Safety Authority in 2004 and a scientific report to the European Food Safety Authority (EFSA) in 2009. Both reports concluded that evidence to suggest A1 milk

could be harmful was insufficient and did not warrant government agencies to take any public health actions (O'Callaghan, 2020).

While research to date would suggest A2 milk could be beneficial in alleviating symptoms of gastrointestinal distress in a certain demographic of at-risk individuals, both the mechanisms for these interactions and the criteria to identify subjects that would benefit from A2 milk are still poorly understood. Further robust and independent research is required before concrete conclusions can be formed (O'Callaghan, 2020).

Although majority of evidences are based on epidemiological data in European countries, no concrete proof of the adverse effect of A1 milk on human health is available till date. At the same time no beneficial effect has also been linked to A2 milk. Majority of the indigenous cows (more than 95%) reared in Indian subcontinent produce A2 milk.





It has been suggested that A1 milk may induce pro-inflammatory and oxidative effects due to the presence of BCM-7, but there is insufficient evidence to associate its consumption with negative health effects and some studies have even shown positive results. However, A2 milk may be better tolerated by the digestive system of some individuals due to its possible modulating role in the intestinal microbiota.

The findings obtained are based primarily on in vitro and animal studies, and limited clinical trials with poor designs. Therefore, more solid scientific evidence is needed to reach a consensus on the role of A1 or A2 bovine milk on health (Gonzales-Malca et al., 2023).

### Authors' Personal Supposition

*Since the A1, A2 hypothesis is based on some epidemiological observations and animal experiments, more scientifically sound proofs are needed. Looking to the complexities of the nutrition science, further research is needed based on cause and effect relationship and it is suggested to consider milk from any milch cattle or buffalo or its products as a wholesome food, which should be part of every*

*healthy humans' diet, especially in a country like ours, where in more of vegetarian population needing much now in maintaining health to have better healthy next generation to make India much stronger, where in health shares the lion's share.*

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# REGULATORY ROUND UP



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Dear Readers,

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

### [Nationwide Extension of provision for Instant \(Tatkal\) issuance of](#)

### [License/Registration in certain categories of food businesses:](#)

The earlier order dated 01.06.2024 was regarding the instant issuance of a license/registration to certain KOBs such as distributors, wholesalers, retailers, transporters, importers, etc. This scheme was applicable only to the states/UTs of Assam, Gujarat, Delhi, Jammu and Kashmir, and Kerala. The scheme is now extended nationwide. This is a good step by the food authorities for enhancing the ease of doing business.

[Testing of prohibited substances declared by the World Anti-Doping Agency \(WADA\) for 'Food for Sportsperson' under FSSAI license:](#) "Food for Sportsperson" must follow FSS

(Nutra) regulations 2016. These regulations specify that prohibited substances declared by

WADA, shall not be added to such products. Centre of Excellence for Research and Analysis of Narcotic Drugs and Psychotropic Substances, Gandhinagar Gujarat, a NABL accredited laboratory, is notified by FSSAI for this purpose. This laboratory may be used by Food authorities for testing Food for Sportsperson for prohibited substances as and when required.

### [Validity Order of FSSAI notified laboratories dated 24.09.2024:](#)

The order is about the list of FSSAI recognised testing laboratories with their validity of NABL accreditation as on 24th September 2024.

[Draft Food Safety and Standards \(Fortification of Foods\) Amendment Regulations, 2024:](#) The draft notification proposes to omit 7 (4) of FSS (Food Fortification) Regulations 2018. The proposed draft amendment recommends the deletion of special warning for

Thalassemia and sickle cell anaemia patient in case of iron fortified salt. [Online comments can be submitted on or before 22.11.2024.](#)

### [Draft FSS \(Contaminants, Toxins and Residues\) Amendment Regulations, 2024 relating to a comprehensive revision of MRL of pesticides:](#)

The draft notification is regarding the revision of the Maximum Residue Limit of pesticides in different food categories. The table in the sub-regulation 2.3.1 regarding MRLs is revised. The comments in the prescribed format are requested online before 22.11.2024. [Comments can also be submitted online.](#)

[Draft FSS \(Contaminants, Toxins, and Residues\) Amendment Regulations, 2024 relating to limits of metal contaminants, Crop contaminants & naturally occurring toxic substances, and antibiotics](#) Comments are requested on the several changes in sub-regulation 2.1.1 of the above regulation in the prescribed format. The comments should be submitted before 25.11.2024. [Comments can also be submitted online.](#)

# RESEARCH IN HEALTH & NUTRITION

## Study examines effect of fish oil in older adults' brains

Clinical trial finds statistically significant benefit for those genetically predisposed to Alzheimer's

August 1, 2024 Science Daily

These findings are promising as they suggest that targeted interventions, such as fish oil supplements, may be beneficial for certain individuals with a genetic predisposition to Alzheimer's disease.

While the study did not show significant benefits for all older adults, it highlights the

importance of personalized medicine in the prevention of cognitive decline and dementia. It is important to note that further research is needed to confirm these results and to determine the optimal dosage and duration of fish oil supplementation for individuals at risk of Alzheimer's disease.

Additionally, additional studies involving larger and more diverse populations are necessary to validate these findings and better understand the potential benefits of fish oil for brain health.

Overall, this study sheds light on the potential role of fish oil supplements in preserving brain health, particularly for individuals with a genetic susceptibility to Alzheimer's disease. It underscores the importance of early intervention and personalized approaches to dementia prevention, and may pave the way for further research and clinical trials in this field.

[10.1001/jamanetworkopen.2024.26872](https://doi.org/10.1001/jamanetworkopen.2024.26872)

## Ketogenic Diet may reduce friendly gut bacteria and raise cholesterol levels

August 6, 2024 Science Daily

The study highlighting the potential risks and benefits of low-carbohydrate diets, specifically ketogenic diets, sheds light on the complex interplay between diet, cholesterol levels, gut microbiome composition, and metabolic health.

While the keto diet was effective in promoting fat loss, it also resulted in adverse effects such as increased cholesterol levels, reduced beneficial gut bacteria like Bifidobacterium, and impaired glucose tolerance. These findings underscore the importance of considering the long-term health implications of dietary choices, beyond just immediate weight loss goals.

The researchers' emphasis on the potential risks associated with ketogenic diets, such as increased risk of heart disease, digestive disorders, and insulin resistance, suggests that a low-

sugar diet may be a more balanced approach for most individuals. By adhering to government guidelines for reducing free sugar intake and promoting fat loss without negative health impacts, individuals can achieve their weight loss goals while maintaining overall health and well-being. Further research is needed to better understand how different individuals may respond to various types of diets, and to develop personalized dietary recommendations for optimal health outcomes.

DOI: [10.1016/j.xcrm.2024.101667](https://doi.org/10.1016/j.xcrm.2024.101667)

The results of the T2D-GENE Trial demonstrate the power of lifestyle changes in reducing the risk of type 2 diabetes, regardless of genetic predisposition.

This study provides hope for individuals with a high genetic risk for the disease, showing that healthy eating habits and regular exercise can make a significant impact on

## Type 2 diabetes can be prevented by diet and exercise even in individuals with a high genetic risk

August 7, 2024 Science Daily



on overall health. The findings highlight the importance of focusing on lifestyle factors such as diet and physical activity in preventing and managing type 2 diabetes. The implications of this research are far-reaching, as type 2 diabetes continues to be

a major public health concern globally. By emphasizing the importance of lifestyle changes in reducing the risk of the disease, healthcare professionals and individuals alike can work together to promote healthier habits and prevent the onset of type 2

diabetes. Moving forward, it is vital to continue educating individuals on the benefits of a healthy diet and regular exercise, as these simple yet impactful changes can have a profound effect on overall health and well-being.  
DOI: [10.1210/clinem/dgae422](https://doi.org/10.1210/clinem/dgae422)

## Diet is main risk factor for colon cancer in younger adults

August 14, 2024 Science Daily

The findings of the Cleveland Clinic study have shed light on the importance of diet in young-onset colorectal cancer risk.

By identifying metabolites derived from red and processed meat as major drivers of this cancer risk in younger adults,

the study emphasizes the need for individuals under the age of 60 to pay close attention to their dietary habits. By discussing their diet with their doctor, young adults can take proactive steps towards preventing colorectal cancer.

The research team at Cleveland Clinic is now focusing on developing strategies to identify at-risk individuals through analysing metabolites in their blood. Rather than relying solely on extensive screening methods like yearly colonoscopies, the team is working towards simpler tests that can measure biomarkers

associated with colorectal cancer risk. By pinpointing specific dietary factors, such as the consumption of red and processed meat, the team hopes to provide targeted interventions that can help prevent or even treat young-onset colorectal cancer.

This groundbreaking research has already influenced the way healthcare providers approach patient care, underscoring the importance of discussing diet and lifestyle choices with patients to empower them to make informed decisions about their health.

DOI: [10.1038/s41698-024-00647-1](https://doi.org/10.1038/s41698-024-00647-1)

The study's findings shed light on the often-overlooked sources of saturated fat and added sugar in the American diet, highlighting the need for increased awareness and better education around food choices.

While it may be obvious that soft drinks and cheese contribute to these dietary concerns, the inclusion of less obvious sources like chicken and ketchup emphasizes the importance of reading labels and being mindful of all the components of one's diet.

By recognizing the unexpected sources of fat and sugar that can pile up throughout the day, consumers can make more

informed decisions about their food and beverage intake, ultimately leading to improved health outcomes.

The development of a research tool to streamline assessment of dietary downsides is a valuable step toward helping individuals better understand and manage their intake of saturated fat and added sugar.

By identifying and targeting the top contributors in these categories, researchers hope to provide the public with a clearer picture of where these nutrients are coming from and how they can make healthier

## Identifying 'stealth' sources of saturated fat, added sugar in the diet

Items beyond cheese, soft drinks contribute to overconsumption

August 15, 2024 Science Daily

choices.

With added sugar appearing in diverse and often surprising foods, from tea to cakes and pies, there is a pressing need for increased awareness and education around the hidden sources of these unhealthy components in the American diet.

DOI: [10.3390/nu16152474](https://doi.org/10.3390/nu16152474)

The results of the study highlight the importance of personalized dietary plans and education in achieving successful weight loss.

By increasing protein and fibre intake and adhering to a low-calorie diet, participants in the Individualized Diet Improvement Program were able to achieve significant weight loss over a 25-month period. The emphasis on personalization and flexibility in the program allowed dieters to create sustainable dietary changes that ultimately led to

successful weight loss maintenance.

The study also sheds light on the impact of protein and fibre consumption on weight loss success. Participants who were able to increase their protein and fibre intake while reducing calories experienced the greatest success in losing weight. Maintaining lean body mass was a key focus of the program, as preserving muscle mass is important for overall health and weight loss

**Weight-loss success depends on eating more protein, fibre while limiting calories**

August 19, 2024 Science Daily

maintenance. By creating individualized plans based on participants' dietary preferences and habits, the iDip program was able to help dieters make lasting changes to their eating habits and achieve significant weight loss results.

DOI: [10.1002/osp4.764](https://doi.org/10.1002/osp4.764)

The findings of this study shed light on the importance of proper nutrition in maintaining cognitive health as individuals age.

The results indicate that vitamin K and folate are crucial nutrients for maintaining brain function and potentially preventing cognitive decline. The study emphasizes the need for a personalized approach to nutrition, as individuals may have varying nutrient needs based on their age, gender, and

lifestyle factors.

Additionally, the study highlights the deficiencies in vitamin K and folate intake in the US population, indicating a need for increased awareness and education on these essential nutrients.

By incorporating scientifically proven amounts of vitamin K2 and folate into multivitamins and nutritional products, individuals may be better equipped to support their

**Tackling vitamin K2 and folate deficiencies essential for senior's brain health**

18 Jul 2024 Nutrition Insight

cognitive health as they age. <https://www.nutritioninsight.com/news/tackling-vitamin-k2-and-folate-deficiencies-essential-for-seniors-brain-health-study-suggests.html>

and older adults.

With significant reductions in fatigue and stress reported after 12 weeks of supplementation, it has shown promising results in promoting overall vitality and well-being. The study also highlighted the potential hormone-balancing effects of ashwagandha in men, with increases in free testosterone and luteinizing hormone levels observed.

Furthermore, the research underscores the importance of quality control in the cultivation and extraction of

botanical ingredients like ashwagandha. With adherence to high standards in extraction processes and botanical integrity, products like ashwagandha can be formulated into various supplements, functional foods, and beverages to support overall health and wellness. With third-party certifications from reputable organizations, consumers can trust that they are receiving a high-quality and standardized product.

<https://www.nutritioninsight.com/news/verdure-sciences-research-on-ashwagandha-shows-major-energy-boost-and-stress-reduction.html>

**Ashwagandha shows major energy boost and stress reduction**

22 Jul 2024 Nutrition Insight

The study conducted by Verdure Sciences on ashwagandha has provided valuable insights into the safety and efficacy of this Ayurvedic ingredient in reducing fatigue and stress levels in middle-aged



## Tocotrienol form of vitamin E superior to regular tocopherol

23 Jul 2024 Nutrition Insight

The findings of the systematic review conducted by researchers from the National University of Medical Sciences, Pakistan, provide valuable insights into the efficacy of tocotrienol versus tocopherol in managing atherosclerotic cardiovascular diseases.

This comparative study underscores the superior antioxidant capabilities of tocotrienol and its potential to

significantly improve cardiovascular health without any reported mortality risk. The research suggests that tocotrienol could play a pivotal role in reducing the global burden of cardiovascular disease and provides new hope for millions of individuals affected by these conditions.

Furthermore, the study emphasizes the importance of incorporating tocotrienols, particularly gamma-tocotrienol for heart health and alpha-tocotrienol for brain protection, in promoting cardiovascular and brain health.

Tocotrienols have been shown

to reduce cholesterol levels, inflammatory biomarkers, and antioxidant status, while modulating microRNA expressions related to cardiovascular health.

The availability of products like TocoGaia provides a practical and convenient way to harness the power of tocotrienols in supporting a healthy heart and mind, especially when combined with other cardioprotective ingredients like omega-3, CoQ10, and phytosterols.

<https://www.nutritioninsight.com/news/research-shows-tocotrienol-form-of-vitamin-e-more-superior-to-regular-tocopherol.html>

## Scientists dispute ultra-processed food definition and research on health impact

04 Jul 2024 Nutrition Insight

The impact of ultra-processed foods on health and disease risk is a topic of intense debate among experts in the field of nutrition.

Some studies suggest that high consumption of UPFs is associated with an increased risk of death and other health issues, while others argue that focusing solely on processing

levels may not necessarily lead to a healthier diet. The NOVA classification system, which categorizes foods based on their processing level, has been a point of contention, with some experts advocating for stricter regulations akin to tobacco, while others point out that the nutritional content of foods should also be taken into consideration.

Research presented at recent conferences like ICO 2024 and Nutrition 2024 has shed light on the cost, nutritional value, and shelf life of differently processed food menus. While a less processed menu was found to be more expensive and had a shorter shelf life compared to a UPF-focused menu, both menus

scored poorly in terms of adherence to dietary guidelines. This highlights the complexity of the issue, as it is possible to eat a low-quality diet even when choosing minimally processed foods, and more-processed diets can be equally nutritious but cost-effective and long-lasting.

Experts emphasize the need for a more comprehensive understanding of the impact of processing levels on the overall healthfulness and sustainability of diets, rather than focusing solely on UPFs.

<https://www.nutritioninsight.com/news/scientists-dispute-ultra-processed-food-definition-and-research-on-health-impact.html>

Amid a growing demand and market for biotics, researchers at the Food Science and Technology department at the University of California (UC) Davis, US, are investigating the chemical building blocks of oligosaccharides —

carbohydrates from three to six units of simple sugars — and how they react with bacteria in the human gut microbiome.

The building blocks of these compounds significantly impact which bacteria can feed off them.

## Potential impact of complex oligosaccharides on gut bacteria

08 Jul 2024 Nutrition Insight

Daniela Barile's research at UC Davis focuses on the role of prebiotics in promoting gut health and combating dysbiosis. She emphasizes the importance of providing beneficial bacteria with their favourite food in order to support their growth and activity in the gut. By studying grape pomace, a byproduct of the wine industry, Barile's lab has uncovered the potential benefits of oligosaccharides and phenolics in promoting the growth of

beneficial bacteria like Bifidobacteria and Lactobacilli. Through extensive lab work and experimentation, Barile and her team are able to identify specific oligosaccharides that are preferred by different strains of bacteria. By examining what bacteria consume and how they interact with oligosaccharides, they can further develop intelligent synbiotics that target specific strains of bacteria for optimal gut health benefits.

Collaborating with industry partners like Sonomaceuticals, Barile's research bridges the gap between academic discovery and practical applications, leading to the development of innovative products that harness the potential of grape marc for promoting gut health and overall well-being.

<https://www.nutritioninsight.com/news/propelling-probiotics-potential-impact-of-complex-oligosaccharides-on-gut-bacteria.html>

The results of the first human clinical trial on cannabigerol (CBG) are promising, showing that the phytocannabinoid can effectively reduce anxiety and stress without the intoxication typically associated with whole plant cannabis.

The study also suggests some memory-enhancing effects of CBG, making it an increasingly popular option for those seeking relief from anxiety and stress. Lead author Carrie Cuttler emphasizes the importance of this research in providing evidence to support the claims made about CBG,

while also urging caution in interpreting the results due to the study's limitations.

The study's findings open up new possibilities for the use of CBG as an alternative to traditional anxiety medications, with over 80% of users claiming its superiority in managing anxiety. While the study did not find significant mood enhancement effects, it did show a significant improvement in memory recall among participants who took CBG. With future studies planned to replicate these findings and explore CBG's effects on other

**CBG reduces stress and improves memory in clinical trial without intoxication**

07 Aug 2024 Food Ingredients First

physiological measures, such as heart rate and cortisol levels, there is potential for CBG to become a valuable tool in reducing anxiety and stress in a safe and effective manner.

<https://www.foodingredientsfirst.com/news/cbg-reduces-stress-and-improves-memory-in-new-clinical-trial-without-intoxication.html>

**Refined cornmeal flour and corn bran mix to better heart health**

08 Aug 2024  
Food Ingredients First

Switching from refined corn flour to a version with corn bran reduced low-density lipoprotein (LDL) cholesterol by 5% to 13.3% in a four-week randomized crossover clinical trial.

This study, led by Dr. Corrie Whisner from Arizona State University, demonstrated the significant impact of incorporating corn bran-enriched flour into the diet to improve heart health. The study's findings were particularly remarkable as 70% of the participants experienced a reduction in LDL cholesterol levels, despite starting with mild to moderately elevated levels.

The study compared the effects of whole grain cornmeal, refined cornmeal, and a blend

of refined cornmeal with corn bran on cholesterol levels. The results showed no significant changes in LDL or total cholesterol levels for the whole grain and refined cornmeal groups. The researchers developed a realistic intervention by providing participants with baked goods made with the specific corn flour types, showcasing how easily incorporating corn bran-enriched flour into the diet can result in tangible health benefits. Additionally, the study assessed the impact on gut microbiota composition,



revealing changes in specific bacterial genera that may play a role in cholesterol reduction. The findings highlight the potential of corn bran as a valuable dietary ingredient for

promoting heart health and the importance of exploring the impact of food choices on overall well-being.

<https://www.foodingredientsfirst.com/news/new-clinical-research-links-refined-cornmeal-flour-and-corn-bran-mix-to-better-heart-health.html>

[st.com/news/new-clinical-research-links-refined-cornmeal-flour-and-corn-bran-mix-to-better-heart-health.html](https://www.foodingredientsfirst.com/news/new-clinical-research-links-refined-cornmeal-flour-and-corn-bran-mix-to-better-heart-health.html)

## Brewers' spent grain, a promising snack ingredient, that can be upcycled to regulate blood sugar levels

By Audrey Yow 03-Jul-2024 - Food Navigator Asia

Brewers' spent grain, particularly those fermented with tempeh mould, is a promising ingredient that not only can be used for snacks, but also reduces food waste.

The study conducted by researchers from the National University of Singapore, funded by the Ministry of Education, highlights the potential benefits of consuming biscuits made

from brewers' spent grain (BSG) in regulating blood sugar levels. The findings suggest that fermenting BSG with *Rhizopus oligosporus* (RO) can enhance the nutritional profile of the biscuits, leading to better control of postprandial glucose response (PPGR) and postprandial insulin response (PPIR). The high fibre, protein, and antioxidant content of BSG, especially when fermented, can slow digestion, promote insulin release, and improve glucose metabolism, making them a promising ingredient to incorporate into food products.

The randomised controlled trial conducted on individuals with metabolic syndrome (MetS) revealed that biscuits containing fermented BSG resulted in lower blood glucose

and insulin levels compared to control biscuits.

The study demonstrated the potential for BSG to positively impact postprandial glycaemic response and insulin sensitivity in individuals with MetS. Moving forward, larger-scale studies are needed to further explore the benefits of BSG consumption on blood sugar regulation, but the results of this research suggest a promising future for incorporating value-added ingredients like BSG into food products to improve health outcomes and reduce waste in the food industry.

<https://www.foodnavigator-asia.com/Article/2024/07/03/brewers-spent-grain-can-be-upcycled-to-regulate-glucose-levels>

## Coffee a 'miracle' drink with many health benefits

By Brian P. Dunleavy  
NEW YORK, July 9 (UPI) --

Consider coffee a "mini-Mediterranean diet," experts told UPI. The health benefits of the beverage millions of people drink to start their day far outweigh the potential risks, much like the popular diet that limits red meat and fat intake, the experts say.

The Mediterranean diet is known for its health benefits, primarily because it is a plant-

based diet. Stephen Safe, a researcher with expertise in cancer prevention, points out that coffee is also plant-based and offers similar health benefits as the Mediterranean diet. Safe, a distinguished professor of biochemistry and biophysics, highlights the numerous studies that support the idea that coffee consumption can reduce the risk of certain types of cancers, Type 2 diabetes, Parkinson's disease, and dementia. He even goes as far as to call coffee a "miracle" drink, much like aspirin is a miracle drug. Research studies have found that coffee drinkers have a lower risk of developing various health conditions. For example, coffee consumption has been

linked to a lower risk of Type 2 diabetes, liver cancer, colon and breast cancers, thyroid cancer, and neurologic diseases like Parkinson's and dementia. Marilyn Cornelis, a long-time coffee researcher and associate professor of preventive medicine, suggests that the antioxidants found in coffee, along with caffeine's neuro-protective effects, may contribute to these health benefits. While there are potential side effects of drinking too much coffee, such as heart palpitations and insomnia, the overall health benefits of coffee consumption are significant.

[https://www.upi.com/Health\\_News/2024/07/09/coffee-health-benefits/1221720458650/](https://www.upi.com/Health_News/2024/07/09/coffee-health-benefits/1221720458650/)

# FOOD SCIENCE & INDUSTRY NEWS

## Functional ingredients space set to expand with consumers demanding holistic benefits

17 Jul 2024 Nutrition Insight

Innovating functional ingredients to support consumers at every stage of life is a key focus for FrieslandCampina Ingredients, Bioiberica, and Gencor.

By starting the research and development process with consumers in mind, these

companies are able to create products that meet the growing demand for holistic health benefits. Combining established and novel ingredients, such as collagen and herbal extracts,

allows for the creation of products like joint health solutions and skin regeneration formulas that can support consumers in a variety of ways.

Proper delivery mechanisms for these functional ingredients are also crucial to ensure maximum

absorption and bioavailability. Companies are utilizing advanced delivery systems and technology, to enhance the functionality of ingredients like curcumin and PEA in food and beverage applications. By focusing on synergy between ingredients, companies are able to create products that not only taste good but also offer multiple health benefits. With a growing market for functional foods and beverages, the demand for innovative and effective delivery mechanisms for these ingredients is only expected to increase in the coming years.

<https://www.nutritioninsight.com/news/functional-ingredients-space-set-to-expand-with-consumers-demanding-holistic-benefits.html>

New customizable plant-based meat alternative, Rindecarne, is a game-changer for consumers looking to incorporate more plant-based proteins into their diets without sacrificing taste or nutrition.

By offering a meat extender that can be added to minced meat, company is providing a versatile and affordable solution for doubling the number of servings in a dish while maintaining the familiar taste and texture of traditional minced meat dishes. This innovation not only meets consumer demand for more

sustainable and nutritious food options but also showcases industry's commitment to developing hybrid products that combine both animal and plant-based ingredients.

With a focus on maximizing nutrition, affordability, and sustainability, industry continues to lead the way in the alternative meat category with innovative products like Rindecarne. By tapping into consumer preferences for plant-based options, it is catering to a wide range of dietary needs and evolving



## Plant-based alternative for hybrid minced meat recipes

05 Jul 2024 Nutrition Insight

tastes. From offering plant-based protein blends for egg dishes to edible plant-based forks and air-fryer friendly meal solutions, company is staying ahead of the curve in providing innovative and convenient food options for consumers around the world.

<https://www.nutritioninsight.com/news/nestle-innovates-plant-based-alternative-for-hybrid-minced-meat-recipes.html>

The research conducted by the Spanish team highlights the shift towards natural preservatives in the food industry, especially in the meat sector.

With the EU regulations limiting the use of chemical preservatives like nitrites and nitrates, finding effective

alternatives is crucial for ensuring food safety and quality. The use of yeast as a natural preservative in Iberian pork loin is a promising development, as it not only inhibits harmful microbes but also maintains the meat's integrity and shelf life.

While the yeast strain *Debaryomyces hansenii* LRC2



## Spanish scientists innovate yeast-based nitrite alternative to extend meat shelf life

16 Jul 2024 Food Ingredients First



has shown great potential in preserving the pork loin, the challenge lies in meeting consumer taste expectations. The researchers acknowledge that the current alternative, while effective in preserving the meat, lacks in sensory quality compared to traditional

preservatives. To address this, the team is working on incorporating complementary strains to enhance the flavour of the Iberian pork loin while still meeting safety standards. With further research and development, it is hopeful that natural preservatives like yeast

can provide a healthier and tastier option for preserving meats in the F&B industry.

<https://www.foodingredientsfirst.com/news/preserving-pork-spanish-scientists-innovate-yeast-based-nitrite-alternative-to-extend-meat-shelf-life.html>

Xampla's innovative technology has the potential to revolutionize the dairy industry by providing a sustainable solution for fortifying products with essential vitamins and nutrients.

By partnering with Yili, a company known for its commitment to innovation and quality, Xampla is able to accelerate the deployment of its nutrient microcapsules to a global market. This collaboration not only showcases the effectiveness of Xampla's technology but also highlights Yili's dedication to

bringing next-generation products to consumers. As the demand for healthier and more sustainable food and beverage options continues to rise, the partnership represents a significant step towards meeting these consumer preferences. With this technology, beverages can now be fortified with essential nutrients without compromising taste or texture, providing a win-win solution for both manufacturers and consumers. By working together, they are not only



**Chinese dairy giant with natural polymer capsules to fortify well-being ingredients**  
18 Jul 2024 Food Ingredients First

driving innovation in the dairy industry but also setting a new standard for fortification technology in the global market.

<https://www.foodingredientsfirst.com/news/xampla-equips-chinese-dairy-giant-with-natural-polymer-capsules-to-fortify-well-being-ingredients.html>

Underscoring the continued consumer demand for products that boost brain power and focus and support immunity, Kyowa Hakko featured its core branded ingredients at IFT First 2024 in Chicago, US.

Cognizin, its premium form of citicoline, has been launched in new product formats, such as chocolates and sweets. The company's immune health ingredient, Immuse, has achieved Non-GMO Project Verified status.

Karen Todd highlighted the benefits of their products Cognizin and Immuse at the IFT show. She emphasized the

versatility of Cognizin in various formats, such as functional protein bars, gummies, lollipops, and functional beverages. The ingredient is known for its ability to increase acetylcholine levels in the brain, supporting cognitive function, focus, attention, mental energy, and memory.

On the other hand, Immuse is a heat-treated, inactive postbiotic that supports gut health and immunity. Todd mentioned that consumer demand for immune health products remains strong, with immunity staying top of mind even post-COVID-19. Immuse's small dosage of about 36 mg,

**Functional F&B with cognition and immune-boosting ingredients**

18 Jul 2024 Food Ingredients First

which equals 100 billion cells, makes it easy to incorporate into various formulations like gummies, melts, and beverages. The ingredient recently achieved Non-GMO Project Verified status, reassuring brands and consumers of its quality and GMO avoidance.

<https://www.foodingredientsfirst.com/news/ift-first-2024-kyowa-hakko-targets-functional-fb-with-cognition-and-immune-boosting-ingredients.html>

As consumer expectations for unique taste sensations and textures continue to rise, the food and beverage industry is undergoing a transformation to meet these demands.

**Formulators tap "sophisticated flavours" and hybrid concepts for enhanced mouthfeel and texture stability**

24 Jul 2024 Food Ingredients First



Manufacturers are focusing on creating innovative textures, reducing sugar and fat content, and prioritizing sustainability in ingredient sourcing and production. Textures like creamy, crispy, smooth, and tender/soft are currently dominating product launches, indicating a shift towards more diverse and layered mouthfeel experiences. Companies are also striving to maintain consistent taste and texture throughout a product's shelf life, driving the need for advancements in food preservation and waste reduction.

Furthermore, the balance between flavour and texture is crucial in product formulations to ensure a harmonious taste that meets consumer expectations. With a focus on upcycling and sustainability, companies are finding creative ways to incorporate heritage ingredients and innovative technologies to enhance taste and texture while meeting health and environmental goals. Ingredients like citrus fibre and corn starch are playing a key role in enhancing texture in food products, providing superior texturizing properties and a cleaner label appeal.

Additionally, the use of microbes in dairy products is revolutionizing texture complexities, resulting in a creamy and smooth mouthfeel that consumers crave. The future of texture in food products lies in a hybrid approach, combining alternative protein sources with stabilizing and texturing systems to create a new generation of foods that offer familiar taste experiences with enhanced textures.  
<https://www.foodingredientsfirst.com/news/formulators-tap-sophisticated-flavors-and-hybrid-concepts-for-enhanced-mouthfeel-and-texture-stability.html>

**GNT Group's partnership with Plume Biotechnology to explore fermentation technologies for natural colours marks a significant step in the company's commitment to sustainability and innovation.**

By expanding its plant-based colour portfolio through fermentation, it aims to offer more efficient and sustainable solutions for its customers. This collaboration with a UK-based start-up demonstrates a dedication to staying at the forefront of technological

advancements in the food and beverage industry.

The company's focus on sustainability is evident in its efforts to reduce carbon emissions and increase water efficiency at its sites. By incorporating fermentation-based colours into its product offerings, GNT is not only broadening its range of ingredients but also ensuring that its operations align with its environmental goals. This commitment to sustainability, coupled with a dedication to



## Plant-based colours with fermentation technology

01 Aug 2024 Food Ingredients First

delivering high-quality products, positions it as a leader in providing innovative and eco-friendly solutions for food and beverage manufacturers worldwide.

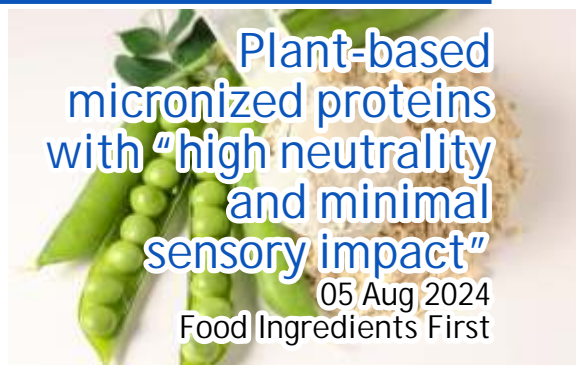
<https://www.foodingredientsfirst.com/news/gnt-expands-exberry-portfolio-of-plant-based-colors-with-fermentation-technology.html>

**Development of plant-based micronized proteins with high neutrality and minimal sensory impact is a game-changer in the food and beverage industry.**

With the increasing demand for protein-enriched products, their new line of Micro Protein offers a clean label, allergen-free solution based on pea proteins. The fine granulometry, neutral taste, and minimal impact on the structure and flavour of the end product make it a versatile ingredient for a variety of food applications.

Emanuele Pizzigalli, chief research and innovation officer and co-founder of HiFood, discusses the market trends driving the development of plant-based proteins. With consumers actively seeking protein-rich snacks and the food industry responding with a variety of protein-enriched products, the demand for innovative solutions like Micro Protein is evident.

By using proprietary technology to micronize the particle size below 30 microns without water, HiFood has created a



## Plant-based micronized proteins with "high neutrality and minimal sensory impact"

05 Aug 2024 Food Ingredients First

highly neutral and allergen-free protein source that can be easily incorporated into a wide range of products. As the industry continues to evolve, HiFood is poised to meet



future trends, such as developing functional ingredients and reducing the use of animal-derived ingredients like eggs. Their

commitment to innovation and sustainability positions them as a key player in shaping the future of food.

<https://www.foodingredientsfirst.com/news/hifood-develops-plant-based-micronized-proteins-with-high-neutrality-and-minimal-sensory-impact.html>

The study conducted by the University of Göttingen sheds light on the level of consumer acceptance for precision fermentation-based (PF) cheese in Germany.

The findings reveal that a significant portion of German consumers are open to trying and buying PF cheese, especially when informed about the various benefits of the technology. Factors such as high product quality, sustainability, and animal welfare emerged as key influencers in consumer acceptance. However, concerns about the impact on traditional agriculture and potential risks to farmers' livelihoods were

shown to decrease willingness to buy and pay for PF cheese.

The study also highlights the importance of clear and effective communication in promoting consumer acceptance of novel food innovations like PF cheese. Providing detailed information about the technology and emphasizing its benefits, such as reduced environmental impact and improved animal welfare, can help increase receptivity among consumers. It is vital to address concerns related to farmers' livelihoods and market power to build trust



## Cow-free cheese: Precision fermentation-based products

05 Aug 2024 Food Ingredients First

and confidence in these new food products. Ultimately, the study advocates for a balanced approach that supports both innovation in the food industry and the preservation of traditional farming practices.

<https://www.foodingredientsfirst.com/news/cow-free-cheese-german-consumers-increasingly-open-to-precision-fermentation-based-products.html>

Precision fermentation is a game-changer in the food industry, offering a sustainable and efficient way to produce high-quality protein and other ingredients for a variety of food products.

The technology is gaining traction as major players such as Hydrosol, 21st.Bio, and Imagindairy work to advance the field and bring innovative products to market. With precision fermentation, the possibilities for creating new ingredients are endless, allowing for the development of unique and functional food products that meet the

demands of today's consumers.

The rising demand for protein-rich foods and sustainable alternatives is driving the growth of precision fermentation in the food industry. Companies like Imagindairy are using advanced AI platforms to optimize microorganisms and production processes, making it possible to produce dairy proteins at a commercial scale.

This technology opens up a world of possibilities for creating new food ingredients and products, from alternative proteins to specialty fats and food colourings. As the industry

## Advancements in precision fermentation for protein innovation

07 Aug 2024 Food Ingredients First

continues to innovate and overcome scale-up challenges, precision fermentation is poised to become a key technology for enabling future food innovation and meeting the growing demand for high-quality, sustainable food products.

<https://www.foodingredientsfirst.com/news/advancements-in-precision-fermentation-pave-the-way-for-protein-innovation.html>

New tapioca-based cook-up starches offer a wide range of benefits for food manufacturers looking to enhance the texture and overall appeal of their products.

These modified starches provide improved viscosity, consistency, and elasticity in a variety of food applications, while also offering advantages such as no off-flavours, enhanced clarity, and neutral colours.



## Tapioca for improved viscosity in sauces, bakery and dairy

08 Aug 2024 Food Ingredients First

By expanding their specialty starch solutions range, Roquette is helping food producers bring innovative and high-quality products to market that meet the growing demand for diverse food experiences.

The versatility and formulation flexibility of the new tapioca starches make them ideal for a range of applications, from sauces to dairy products and

bakery fillings. Each grade is specifically designed to address different texture needs, providing manufacturers with options to create products that stand out in terms of both taste and appearance. In addition to their technical advantages, the Clearam TR range also caters to the clean label trend by offering allergen- and gluten-free options that meet consumer demands for

transparent and label-friendly products. Roquette's commitment to innovation and sustainability is evident in their ongoing efforts to develop cutting-edge solutions that cater to the evolving needs of the food industry.

<https://www.foodingredientsfirst.com/news/elevating-texture-roquette-leverages-tapioca-for-improved-viscosity-in-sauces-bakery-and-dairy.html>

The Ice Cream Sandwich is available in classic vanilla flavour, as well as matcha green tea and yuzu citrus flavours.

The mochi rice cake adds a chewy and textural element to the dessert, complementing the smooth and creamy ice cream. The use of Solein in the ice cream not only adds a unique twist to the traditional dessert but also provides a sustainable and environmentally friendly source of protein.

Ajinomoto's introduction of the Atr. 72 brand of desserts

reflects the company's commitment to creating innovative and nutritious food options that cater to modern consumers' tastes while also promoting sustainability. By using environmentally conscious ingredients and drawing inspiration from traditional festivals and cultural influences,

Ajinomoto is able to offer a unique and delicious culinary experience that appeals to a wide range of consumers. With the launch of the Flowering Mooncake and Ice Cream



Sandwich at pop-up stores in Singapore, Ajinomoto is sure to make a lasting impression in the dessert market with these nutrient-rich and eco-friendly treats.

<https://www.foodingredientsfirst.com/news/ajinomoto-launches-new-mid-autumn-festival-atlr72-sweets-with-microbial-protein-from-co2.html>

## Upcycled sweetener made from apples, pears

By Ryan Daily  
09-Jul-2024 -  
Food Navigator USA



Plant-based ingredient company Fooditive is helping US CPG companies develop better-for-you products with its Keto-Fructose, a sweetener that is similar to allulose and provides a fraction of the calories of sugar, company CEO Moayad Abushokhedim told FoodNavigator-USA.

Innovative approach to creating alternative sweeteners highlights the company's commitment to providing sustainable and functional sugar alternatives to meet the evolving needs of consumers and food manufacturers.

By utilizing bioconversion fermentation processes and tapping into various raw material sources, Fooditive is able to create versatile and effective sweeteners like Keto-Fructose that can be used in a wide range of applications.

As more consumers look to reduce their sugar intake,

Fooditive's forward-thinking solutions are poised to make a significant impact in the food industry by offering healthier and more sustainable alternatives to traditional sugars.

With an emphasis on functionality, taste, and accessibility, company is well-positioned to continue leading the way in the development of innovative plant-based food ingredients.

<https://www.foodnavigator-usa.com/Article/2024/07/09/Fooditive-expands-upcycled-sweetener-made-from-apples-pears-to-the-US>



Chef Andrew Hunter promotes using umami, the fifth basic taste, to not only reduce sodium but also transform foods into a flavour-packed experience.

Despite the instant recognition of sweet, salty, bitter, and sour tastes, the concept of umami remains abstract and difficult to define. Chef Andrew Hunter, known for his expertise in umami-enhanced cooking, describes this elusive fifth taste as a combination of flavours that is both familiar and foreign. By embracing the power of umami, food manufacturers can elevate the sensory experience of their dishes while reducing the reliance on sodium as a flavour enhancer.

Umami, often described as meaty and savoury, is a flavour profile that can enhance other tastes and elevate dishes to a new level. While sweet, salty, bitter, and sour are well-known basic tastes, umami is often disregarded or misunderstood. However, chef Andrew Hunter believes that umami has the power to revolutionize the food industry, particularly in reducing sodium levels while still maintaining rich and flavourful dishes.

Umami-rich foods like soy sauce and parmesan cheese are created through processes like fermentation, which develop their distinct flavours. By incorporating umami into recipes, chefs and food manufacturers can create



## Harnessing umami can help cut sodium and boost flavour

Cindy Hazen,  
SupplySide F&B July 8, 2024

depth of flavour without relying solely on salt. Hunter emphasizes the importance of understanding the intricate role that umami plays in enhancing dishes, and encourages chefs to explore its potential in their cooking. By embracing umami's unique properties, chefs and manufacturers can create delicious and satisfying meals that prioritize both flavour and health.

<https://www.foodingredientsfirst.com/news/protein-developments-innovators-tap-into-yeast-and-plant-based-blends-to-meet-diversifying-demand.html>

## Mission to reduce sodium levels with innovative Asian staples range

By Audrey Yow 03-Jul-2024 -  
Food Navigator Asia

Australian-based start-up Heartful Flavours is on a mission to educate consumers that their taste buds can get used to less salt, as it ramps up promotion of its salt-free Asian staples.

Heartful Flavours is revolutionizing the way people enjoy Asian cuisine by providing salt-free packet sauce powders that are not only delicious but also beneficial for overall health. With the alarming statistics on sodium intake and its impact on heart health, co-founder Rebecca Luong recognized the need for a

healthier alternative that still captures the essence of traditional Asian flavours. By using natural ingredients like yeast, herbs, and spices, Heartful Flavours is able to create meal bases such as Thai Green Curry, Korean Bibimbap, and Vietnamese Pho that are not only low in sodium but also nutritionally balanced. Luong's background as a dietician and health expert allows her to educate consumers on the importance of reducing salt intake and how their taste buds can adapt over time. With their innovative products and commitment to promoting heart health, Heartful Flavours is paving the way for a new era of guilt-free Asian cuisine.

Luong, along with her co-founders Gordon Fung and Jansen Lorbes, put in two years of hard work to perfect the taste of their healthy, natural, and plant-based meal bases. With a background in food

science and a deep understanding of Asian cuisine, the trio experimented with different formulations to create a product that not only tastes delicious but is also packed with premium ingredients such as yeast, herbs, spices, fruit, and vegetables. Their meal bases have received positive feedback during sampling sessions and have been praised for their affordability at \$10 AUD for a pack that serves four.

Additionally, the nutritionally balanced recipe suggestions on the pack make meal preparation quick and easy, ensuring that each serving offers a healthy balance of vegetables, carbohydrates, and protein. With their commitment to using only the best ingredients and promoting healthy eating habits, Luong and her co-founders are on a mission to revolutionize the way people cook and eat Asian dishes.

At home, customers can customize their meals by adding their choice of protein and vegetables to enhance the taste. They can also gradually reduce the amount of salt they add to their food, following a step-by-step process recommended by Luong, the founder of Heartful Flavours.

By giving consumers the option

to control their salt intake, the brand aims to empower individuals to make healthier choices in their diet. Through their social media channels, Heartful Flavours is educating the public about the importance of reducing sodium intake and how taste buds can adapt to lower levels of salt over time. With plans to expand their product line and

establish their brand in Australia and beyond, Heartful Flavours is on a mission to offer healthier versions of popular Asian dishes while promoting choice and control in maintaining a balanced diet. <https://www.foodnavigator-asia.com/Article/2024/07/03/Heartful-Flavours-on-a-mission-to-reduce-sodium-levels-with-innovative-Asian-staples-range>

## Five ways AI is transforming the confectionery sector

By Natasha Spencer-Jolliffe  
08-Jul-2024 - Food Navigator

With AI at the helm, the confectionery industry is entering a new era of innovation and efficiency, transforming everything from product creation to personalized marketing strategies.

The confectionery sector is undergoing a significant transformation thanks to the integration of AI technologies. From personalized marketing campaigns to interactive initiatives, AI is revolutionizing the way confectionery brands engage with consumers. Gen AI, a subset of AI that focuses on content creation, is playing a major role in this evolution. Brands are leveraging gen AI to

tailor their marketing strategies and drive sales. By harnessing the power of AI, these companies are able to create more engaging and impactful campaigns that resonate with consumers on a deeper level. As the industry continues to embrace AI technology, we can expect to see even more innovative and creative approaches to marketing within the confectionery sector.

AI is revolutionizing the way flavour profiles are shaped in the confectionery industry, predicting what consumers and markets may want from sweet treats' taste profiles. By removing the trial-and-error of flavour experiments, AI proves to be a valuable tool in the R&D process, reducing the risk of disappointing product launches. Brands are using AI to anticipate upcoming flavour trends and create innovative products that appeal to a global audience.

Additionally, companies are

implementing AI-led strategies to enhance the environmental friendliness of their manufacturing processes, contributing to a more sustainable future. Through collaborations and initiatives, brands are leveraging AI to maximize traceability and transparency throughout the supply chain, ultimately improving quality assurance and consumer trust.

This trend towards incorporating AI in the confectionery industry is reshaping the way companies operate and interact with consumers. From optimizing supply chain logistics to enhancing quality control and customer service, AI is revolutionizing every aspect of the confectionery business. As technology continues to advance, we can expect to see even more innovative applications of AI in the industry, ultimately leading to improved efficiency, quality, and customer satisfaction.

Here's how sensory experts advise navigating the push-and-pull relationship of creating new products that strike the perfect blend of familiar and fun.

Texture deeply influences flavour by dictating "flavour release," making it a crucial component in the

overall sensory experience of a food product. When developing a healthier version of a traditional snack, it is important to consider whether flavour or texture is the primary appeal to consumers. Healthy alternatives often aim to balance familiar flavours with new textures or familiar textures with more exotic flavours.

Perfectly balanced texture and flavour is hard to find in healthy snacks

Nick Collias,  
Food & Beverage Insider  
June 13, 2024



The relationship between taste and texture is complex, with experts navigating how to create products that hit the sensory sweet spot.

Understanding how texture affects flavour release is key, as different textures can impact how quickly and intensely flavours are experienced by the consumer. Achieving the right balance between texture and flavour is a continuous challenge, requiring close collaboration with customers to determine their preferences and expectations. Ultimately, texture is not just a

complement to flavour, but a critical contributor that influences the overall taste experience.

The interplay between flavour and texture is crucial when developing a healthy alternative to a traditional snack food. Determining whether to prioritize one over the other is a key factor in creating a successful product. Understanding the historical appeal of a snack can help guide decisions on where to take risks. For example, when creating a kale chip, mimicking

the texture of a traditional chip while offering familiar flavours like salt and vinegar can help bridge the gap between novel and familiar. Conversely, if the texture of a product is already familiar, it allows for more adventurous flavour choices, such as a sweet-and-spicy chili lime potato chip. Striking a balance between innovation and familiarity is essential in creating a healthy product that appeals to consumers.

<https://www.foodbeverageinsider.com/snacks/the-perfect-balance-of-texture-and-flavor-can-be-hard-to-find-in-healthy-snacks>

Food manufacturers are prioritising food-waste reduction at all stages of production, and in doing so, are reducing costs too.

In addition to the environmental impact, food waste also has ethical implications, especially when so many people around the world suffer from hunger. The UN estimates that 690 million people go to bed hungry each night, while over 2 billion people do not have regular access to safe, nutritious and sufficient food.

By reducing food waste, we can not only help alleviate hunger and food insecurity, but also ensure a more sustainable future for all. It is essential that all stakeholders in the food supply chain work together to address this issue and implement effective solutions to reduce food waste and promote a more sustainable food system for the benefit of both people and planet.

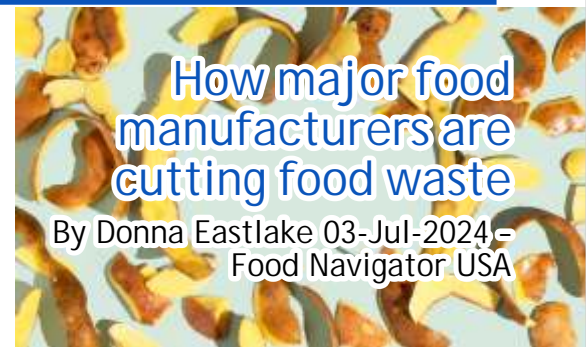
Big food manufacturers are making significant strides in tackling the issue of food waste

within their operations. Companies are approaching the problem holistically, implementing strategies to identify and reduce food waste across all aspects of their businesses.

By conducting waste inventories, setting targets for waste reduction, and diverting byproducts to animal feed, these manufacturers are not only reducing their environmental impact but also saving money in disposal costs. This approach is not only benefiting the companies themselves but also aligning with the goals of animal welfare organisations and environmental advocates, making it a win-win for all involved.

As more food manufacturers prioritize reducing food waste, the industry as a whole is moving towards a more sustainable and efficient future.

By setting targets and working together to reduce food waste, food manufacturers are not only contributing to a more sustainable future but also



reaping financial benefits. By prioritizing waste elimination and seeking opportunities to reduce waste early in the production process, companies are not only reducing their environmental footprint but also improving efficiency and cutting costs.

Through collaboration and innovation, the food industry is finding ways to address the challenge of food waste and create a more sustainable supply chain for the future. It is clear that reducing food waste is not just a corporate responsibility, but also a strategic imperative for food manufacturers looking to thrive in a changing world.

<https://www.foodnavigator-usa.com/Article/2024/07/03/how-mondelez-and-kraft-heinz-are-cutting-food-waste>

## How sustainable is aquaculture?

By Augustus Bambridge-Sutton  
02-Jul-2024 - Food Navigator

With aquaculture now accounting for more of the world's fish than wild caught, it is no longer a niche production method. How does it really stack up on sustainability?

Fish farmed through aquaculture has become the predominant source of aquatic animal products for human consumption, surpassing wild caught fish for the first time. According to a report by the FAO, over 57% of aquatic animal products now come from aquaculture. This method of

controlled cultivation and rearing of fish and seafood has produced 223.2 million tonnes in 2022 alone, contributing significantly to the global animal protein supply. As aquaculture continues to expand, it is crucial that sustainability practices are maintained to ensure the health of marine ecosystems. With innovative companies like Wanda Fish and Bluu Seafood developing cultivated fish products as a more sustainable alternative, the future of aquaculture looks promising in meeting the growing demand for seafood.

Additionally, aquaculture can lead to the overuse of antibiotics and chemicals, which can harm both the environment and consumer

health. In some cases, aquaculture can also lead to the introduction of invasive species into local ecosystems, disrupting the balance of marine life. It is crucial for aquaculture practices to be carefully regulated and monitored to ensure that they do not have negative consequences on the environment or human health. Despite these drawbacks, when done sustainably and responsibly, aquaculture has the potential to provide a reliable source of healthy seafood while reducing the pressure on wild fish populations and promoting food security.

<https://www.foodnavigator.com/Article/2024/07/02/How-sustainable-is-aquaculture>

## AI-powered taste evaluation platform

By Deniz Ataman 12-Jul-2024 -  
Food Navigator USA

Kalsec, a natural food and beverage ingredients supplier, and Italian neuroscience company Thimus launch T-Box, an AI-powered taste evaluation platform designed to enhance accuracy and streamline sensory evaluations in new product development.

T-Box is revolutionizing the way we understand food sensory

perception by using cutting-edge technology and AI to collect and monitor data from brain signals emitted in response to food. By creating a more comprehensive language of food sensory perception, T-Box has the potential to help reduce food waste and loss by objectively characterizing food quality and helping determine the deterioration levels of certain foods.

The partnership between Kalsec and Wageningen University & Research is a groundbreaking collaboration that is pioneering a new era of sensory research. By combining the expertise of

Kalsec with the leading food research university in the world, the House of Humans lab is poised to make significant advancements in sensory evaluation and potentially reduce food waste on a global scale. Through their innovative approach to sensory research, Kalsec and Wageningen University are setting the stage for future developments in the industry and creating a common language around sensory perceptions that could have far-reaching implications.

<https://www.foodnavigator-usa.com/Article/2024/07/12/kalsec-partners-with-thimus-to-launch-t-box-an-ai-powered-taste-evaluation-platform>

The alternative-protein market might have an opportunity to kickstart market growth with innovative products that cater to more meal occasions, including breakfast, and by meeting the demands of flexitarian consumers, Fazeela

Abdul Rashid, partner at venture capital firm Revolution, told FoodNavigator-USA.

The alternative-protein market has become saturated with similar products such as burgers, nuggets, and grounds that do not fully meet the

## How alt protein can capitalize on areas of whitespace innovation

By Ryan Daily 04-Jun-2024 -  
Food Navigator USA



needs of consumers. While there is strong interest from consumers in alternative proteins, many feel disappointed by the lack of options that are both sustainable, nutritious, and appealing in taste. This lack of versatility in alt-protein products means that consumers are not able to find products that meet all of their needs, and as a result, the market is experiencing some softness. To address this issue, experts like Rashid and Valenti-Jordan suggest that the next generation of alt-protein products should focus on building more versatile proteins that do not require extensive formulation and can cater to a wider range of applications. By developing more robust protein systems, the industry can

create products that are both sustainable and delicious, without the need for heavy flavourings or additives.

As the alt-protein market continues to grow and evolve, there is a clear trend towards expanding offerings to cater to a wider range of consumer needs. By adding breakfast and deli-meat options, as well as chef cuts and blocks in foodservice, companies are finding new ways to appeal to a broader audience. Israeli-based company Yo Egg has introduced a plant-based sunny-side-up egg, while Umarm Foods is set to launch seaweed-based bacon in a major retailer with significant financing behind it.

Moreover, hybrid alt-protein and animal-based products are

emerging as a popular choice for flexitarians who want to enjoy the benefits of alternative protein without entirely giving up animal-based options. With companies like SCiFI Foods pushing the boundaries of innovation with cell-cultivated beef for burgers, the alternative protein industry is redefining itself and expanding its appeal to a wider base of consumers. As the industry continues to evolve, there is a shift towards accommodating different dietary preferences and finding new ways to create proteins that meet the needs of a diverse market.

<https://www.foodnavigator-usa.com/Article/2024/06/04/Moving-beyond-nuggets-burgers-How-alt-protein-can-capitalize-on-areas-of-whitespace-innovation>

Quorn is the latest to delve into the controversial 'hybrid meat' category, which gives consumers products that are neither fully meat nor fully meat free. But why now?

The rise of hybrid meat and dairy products, which combine animal-derived ingredients with vegan or vegetarian alternatives, presents an interesting opportunity for brands to cater to flexitarian consumers looking to reduce their intake of animal products. While popular brands like Quorn have recently entered the blended product market, there is still some debate around the effectiveness of these products in actually reducing meat consumption. While some in the food industry see potential in the hybrid category, others remain sceptical about whether these products truly serve a purpose or are just a fleeting trend. Ultimately, the success

of hybrid meat and dairy products will depend on whether they can truly appeal to consumers looking to make more sustainable food choices.

While the plant-based category may be seeing a downturn, the trend towards reducing meat consumption is still strong. Consumers are turning away from both real meat and plant-based alternatives due to cost concerns, according to Kantar. Quorn, a longtime player in the meat alternative market, is now pivoting towards selling mycoprotein for blended meat products in order to appeal to a broader market of flexitarians. While the number of true flexitarians may be debated, the overall trend towards reducing meat consumption for environmental and health reasons remains prevalent. Quorn's focus on helping everyone eat less meat, rather than just catering to



vegetarians and vegans, reflects this changing landscape in the food industry. With the world's increasing focus on sustainability and climate change, products like Quorn's blended meat options may indeed offer a viable solution for consumers looking to make more environmentally friendly food choices.

<https://www.foodnavigator-usa.com/Article/2024/07/12/quorn-s-hybrid-meat-product-aimed-at-flexitarians>

## Tech is shaping consumer eating habits – how can manufacturers stay one step ahead?

24-Jun-2024 Food Navigator USA

Brands are increasingly leveraging technology to deliver variety in food and beverage choices that meet consumer demands.

Food manufacturers need to adapt to this changing landscape by utilizing data-driven insights to cater to the evolving needs and preferences of consumers. By understanding how technology is shaping consumer behaviour and influencing their decisions around food and health, manufacturers can develop products that meet these demands. This may involve creating personalized and tailored offerings, leveraging AI and machine learning to provide real-time insights, and developing innovative solutions that cater to specific health conditions and dietary requirements. By staying ahead of the curve and embracing the opportunities presented by technology, food manufacturers can not only meet consumer

expectations but also drive growth and innovation in a rapidly evolving market.

Tech has revolutionized the way consumers shop for and plan their meals, with personalized recommendations and nutritional details readily available through QR codes and apps. While data sharing may be a concern for some, the majority of US consumers are willing to share personal information with tech companies in exchange for benefits like personalization and savings. Online meal kit and snack delivery services have also seen a surge in popularity, with 30% of US consumers using an online meal kit service in just three months. Additionally, the digitalization of food experiences both in and out of home, fuelled by social media and smart appliances, is transforming the way consumers engage with food brands and restaurants. As technology continues to enhance our lives, from inspiring creativity in the kitchen to addressing dietary requirements, consumers are embracing tech solutions to enjoy more immersive dining experiences and make more informed food choices.

Consumers' feedback about how they feel physically and mentally is crucial in evaluating the success of an eating approach or diet, according to DuBow. The sensory experience, including flavour, aroma, colour, and texture, plays a significant role in whether consumers will commit to a particular dietary plan.

With AI algorithms now offering personalized recommendations based on previous orders and taste preferences, consumers are enjoying a tailored approach to their nutrition. The rise of genetic analysis, such as the 'DNA diet', takes personalization to the next level, with consumers showing interest in personalized nutrition plans. ADM's comprehensive solutions and expert team provide a competitive edge in the global food and beverage industry, allowing manufacturers to stay ahead in nutrition innovation. Partnering with ADM can help companies drive global capabilities and succeed in the ever-evolving culinary landscape.

<https://www.foodnavigator-usa.com/News/Promotional-features/Smart-technology-is-impacting-human-nutrition-and-eating-habits>

## Sugar reduction: Three learnings from growth markets

By Flora Southey  
09-Jul-2024 – Food Navigator

How do approaches to sugar reduction in growth markets differ from those in the rest of the world?

Excessive sugar consumption has become a major concern

for population health, as it is linked to obesity and noncommunicable diseases like dental caries. With the pressure to reduce sugar in food and beverages increasing, both mature markets and growth markets are making efforts to cut back on the sweet stuff. However, the strategies and trends for sugar reduction differ across regions. In growth markets, local sugar reduction technologies are often preferred, as they cater to the

specific tastes and preferences of consumers in that region.

Growth markets, which include regions like Asia Pacific, Africa, and Latin America, are home to a large percentage of the world's population. These markets are not only adopting sugar reduction strategies unique to their region but are also leading the way in implementing sugar reduction regulations.



Countries like Mexico, the Philippines, Indonesia, and Chile are at the forefront of sugar reduction policies, with initiatives such as sugar taxes and front-of-pack labelling.

This shows that growth markets are taking proactive steps to address the challenges of excessive sugar consumption, setting an example for more mature markets to follow.

<https://www.foodnavigator.com/Article/2024/07/09/sugar-reduction-trends-in-emerging-markets>

## What's the biggest trend in better-for-you snacking?

By Flora Southey 19-Jun-2024 - Food Navigator

What's the one key trend in the better-for-you snacks category? We put the question to Mondelez, Nestlé, Ferrero, and Mars.

The shift towards better-for-you snacks is undeniable, with consumers increasingly seeking out healthier options that align with their personal health and nutrition needs. This trend is reflected in the market growth of better-for-you snacks, with a

predicted increase in value to \$53bn by 2033. From reduced sugar to high protein options, consumers are spoiled for choice when it comes to healthier snacking alternatives.

Personalisation is a key trend in the better-for-you snacking category, with consumers looking for snacks that cater to their specific health and nutrition needs.

High protein snacks are also a popular trend that shows no signs of slowing down. Companies are embracing the high protein trend by acquiring brands that offer low-sugar, protein-rich snack options. Functional snacking and

'snacking with purpose' are two key trends, as the company aims to deliver snacks with added benefits such as increased wholegrain and fibre content.

Overall, the biggest trend in snacking seems to be 'choice', with consumers expecting a range of options that cater to their evolving tastes and dietary needs. As the snacking category continues to grow, companies are innovating to offer consumers more choices without compromising on taste or health benefits.  
<https://www.foodnavigator.com/Article/2024/06/19/trends-in-better-for-you-snacking-for-mars-nestle-mondelez-ferrero/>

Upcycling would-be wasted food or side streams from manufacturing into nutritious and sustainable products for human consumption continues to gain traction with more companies calling out the claim and sales of Upcycled Certified products overall growing 39.9% year-over-year to \$42 million in 2023 and units increasing 22% in the same period.

In 2023, sales of Upcycled Certified products within the food and beverage industry saw a significant surge in double and triple digits. Standout categories included snacks, juices, and ingredients, with sales reaching \$20 million across various product categories. The CEO of the Upcycled Food Association, Amanda Oenbring, highlighted the growth in sales of snacks

and beverages, particularly in shelf-stable chips, pretzels, nuts, trail mix, dried fruit, and refrigerated juices. The shift towards using upcycled ingredients in products has been a driving force behind the increase in consumer awareness and sales.

The addition of upcycling to the EPA's Wasted Food Scale has further validated the importance of upcycling as a key solution in reducing food waste and promoting sustainability. Consumer awareness of Upcycled Certified products has also grown, with 40% of shoppers in 2021 factoring in upcycling into their purchase decisions. The Upcycled Food Association has launched a comprehensive education campaign and Upcycled Food Month to further drive awareness and sales of

## Upcycled Certified helps drive sales of snacks, juices, ingredients double & triple digits

By Elizabeth Crawford  
10-Jul-2024 - Food Navigator USA

upcycled products. Looking ahead to 2025, the association plans to deepen its strategy, support retailers, and continue to promote the benefits of upcycled products. Interested stakeholders are encouraged to become members of the association to access networking opportunities and tools to support innovation and advertising in the upcycled food industry.  
<https://www.foodnavigator-usa.com/Article/2024/07/10/upcycled-certified-helps-drive-sales-of-snacks-juices-ingredients>

## 'New Gen' prospects: Young China, India consumers still set to drive luxury food and beverage retail despite slower economy

By Pearly Neo 16-Jun-2024 -  
Food Navigator Asia

Younger millennial consumers from China and India are still set to be the biggest drivers of luxury food and beverage purchasing, despite the generally slower economic conditions in the region and globally.

The rise of the younger generation in China and India as key consumers in the luxury food and beverage sector

highlights a shift in consumer behaviour and preferences in these markets. With a focus on quality over price, these consumers are more open-minded, willing to spend on leisure and luxurious items, and seek out products that align with their values and identity. This presents a unique opportunity for businesses looking to tap into these growing markets, as long as they are willing to adapt their strategies to meet the changing demands of these consumers.

In addition to China and India, the overall Asian market presents significant opportunities for growth in the luxury food and beverage sector. With a large population, rising middle class, and increased foreign investment in

countries like Indonesia, Vietnam, and South East Asian markets, businesses have a chance to capitalize on the increasing demand for premium products in the region. Ignoring the developments in Asia could mean missing out on a key market that is driving innovation and growth in the industry. As such, companies that are able to adapt to the changing landscape and meet the needs of the younger, more discerning consumers in these markets will likely find success and recognition in the luxury food and beverage sector.

<https://www.foodnavigator-asia.com/Article/2024/06/17/young-china-india-consumers-still-set-to-drive-luxury-food-and-beverage-retail-despite-slower-economy>

## The art of snacking smarter: Implications for producers

By Gill Hyslop 29-May-2024 -  
Food Navigator

The increased focus on functional snacks is not only driven by the aging population and the desire for healthier aging, but also by younger generations who are more health-conscious than ever before.

With busy lifestyles and a greater awareness of the importance of nutrition, consumers are looking for

snacks that can support their overall well-being while being convenient and tasty.

In response to this demand, the snack industry has been quick to adapt, offering a wide range of fortified and functional snacks that cater to different health needs and preferences. From on-the-go protein bars to snacks enriched with superfoods and antioxidants, there is a functional snack for everyone.

This trend is expected to continue growing as consumers become more educated about the benefits of functional ingredients and seek out snacks that can help them achieve their wellness goals.

Overall, the fortified and functional snacks market presents a lucrative opportunity for manufacturers to meet the evolving needs of health-conscious consumers while also promoting sustainability and ethical practices.

By continuing to innovate and prioritize both nutritional benefits and environmental sustainability, the snack industry can thrive and make a positive impact on the health of individuals and the planet alike.

<https://www.foodnavigator.com/Article/2024/05/29/the-art-of-snacking-smarter-what-are-the-implications-for-producers/>



A survey reveals that European consumers want the freedom to choose whether to eat cultivated meat once EU regulators have approved it.

Most of those surveyed also think that cultivated meat packaging should be allowed to use "meaty" names such as "chicken", "burger" and "sausage" while making it clear that the cultivated meat comes from a different production process.

The consumer research conducted by YouGov Deutschland and commissioned by GFI Europe sheds light on the growing acceptance and interest in cultivated meat across various European countries. Despite pushback in countries like Italy, where there is a move to ban this new form of food production to protect culinary heritage, the research indicates that a majority of consumers in countries like Portugal, Spain, Germany, and Belgium are in favor of cultivated meat being approved

for sale if deemed safe and nutritious by food regulators.

The findings also highlight the importance of consumer choice when it comes to cultivated meat, with a significant portion of respondents believing that it should be up to individuals to decide whether or not they want to consume it. This research serves as a valuable tool for policymakers in the EU and member states to understand consumer sentiment and preferences regarding this innovative food technology. It also emphasizes the need for more awareness and accurate information about cultivated meat to be disseminated, especially in countries where knowledge about this new food source is limited.

The increase in potential cases of olive oil fraud and mislabelling in the EU reflects a broader trend of rising prices for key commodities worldwide.

With prices for extra virgin olive oil skyrocketing to unprecedented levels, industry experts warned of a potential imbalance between supply and demand. This crunch has led to increased instances of fraud, including mislabelling, adulterated olive oil, and potential cases of fraud.

To combat this issue, the European Commission has emphasized its zero-tolerance

approach towards food fraud. The EU Agri-Food Fraud Network serves as a crucial forum for member states to cooperate and exchange information to detect and prevent fraudulent activities.

Despite existing legislation on olive oil quality standards and labelling rules, the EU recorded a significant increase in cases of olive oil adulteration and fraud in the first quarter of 2024, highlighting the need for stricter enforcement and enhanced vigilance throughout the agri-

## REGULATORY NEWS

### GFI survey finds European consumers want freedom to choose cultivated meat

18 Jul 2024 Food Ingredients First

With a promising future ahead for the cultivated meat industry, there is a growing recognition of its potential to contribute to food security, sustainability, and animal welfare, prompting calls for policymakers to support its development and commercialization.

<https://www.foodingredientsfirst.com/news/gfi-survey-finds-european-consumers-want-freedom-to-choose-cultivated-meat.html>

food chain.

In addition to cracking down on olive oil fraud, the EU is also taking steps to address fraudulent activities in other food and beverage sectors, such as honey, coffee, and cocoa.

### EU records spike in olive oil fraud and mislabelling cases as climate change batters production

29 Jul 2024 Food Ingredients First

A recent provisional agreement between the European Parliament and EU Council aims to increase transparency in the honey sector and combat adulteration, particularly concerning honey imported

from non-EU countries suspected of being mixed with sugar. These efforts reflect the EU's commitment to ensuring the integrity and quality of food products on the market and protecting consumers from

potential health risks associated with food fraud.  
<https://www.foodingredientsfirst.com/news/eu-records-spike-in-olive-oil-fraud-and-mislabeling-cases-as-climate-change-batters-production.html>

By securing the grant from the European Innovation Council and funding from Horizon Europe, Melt & Marble is well-positioned to revolutionize the food industry with their innovative fermentation-based fats.

These funds will enable the company to further develop and scale their process, bringing them closer to offering healthier and more sustainable alternatives to traditional meat and dairy products. With their products, MeatyMarble and DairyMarble, Melt & Marble aims to not only improve the nutritional profile of alt-meat and alt-dairy products but also

reduce the environmental impact of food production. Through their precision fermentation and microbial engineering platform, Melt & Marble is paving the way for the next generation of dairy fats that can be used in a variety of food applications. Their collaboration with Rise Processum and other entities in the Delicious project demonstrates their commitment to expanding their product line and pushing the boundaries of food technology. With the growing demand for plant-based and sustainable food options, Melt & Marble is poised to make a significant impact in the industry and



contribute to a more environmentally conscious food system.

<https://www.foodingredientsfirst.com/news/eu-backs-melt-marbles-fermentation-based-designer-fats-for-meat-and-dairy-alternatives.html>

Brook and Whittle's GreenLabelBlockOut light-blocking shrink sleeve solution has recently gained recognition from two prominent organizations for its performance and compatibility with recycling systems.

The opaque sleeve, which does not contaminate plastic recycling chains, was evaluated based on its materials, components, and packaging design. This groundbreaking solution is designed for brands that require light-blocking packaging and want to move from plastic to clear PET, offering a significantly lower carbon footprint and increased recyclability.

The Association of Plastic Recyclers (APR) has recognized

Brook and Whittle for meeting or exceeding the voluntary requirements for APR Design for Recyclability Recognition. This acknowledgment highlights the potential impact of the GreenLabelBlockOut shrink sleeves on increasing the amount of clear PET material that can be reclaimed and used for bottle-to-bottle circularity.

Additionally, How2Recycle has pre-qualified the shrink sleeve as widely recyclable on eligible clear PET bottles, further emphasizing the sustainability and recyclability of this innovative packaging solution. These recognitions validate Brook and Whittle's commitment to sustainability



and responsible innovation, showcasing their dedication to developing solutions that address critical industry needs while ensuring product integrity.

<https://www.foodingredientsfirst.com/news/brook-and-whittles-light-blocking-shrink-sleeves-allow-contamination-free-clear-pet-recycling.html>



The wellness industry is booming, with health and fitness trends becoming popular amongst consumers and profitable for brands. But do consumers trust the 'better-for-you' marketing printed on the products they buy?

The wellness trend has taken the world by storm, with consumers demanding healthier and more transparent options when it comes to food choices. This has led to the rise of functional foods, which claim to have additional health benefits beyond basic nutrition. However, with consumer trust in the food industry declining, many are questioning the validity of 'better-for-you' marketing on snacks.

To combat this mistrust, the food industry is focusing on improving nutritional transparency, with initiatives

such as the 'clean label' movement and front-of-pack labelling. These efforts aim to provide consumers with clear and concise information about the ingredients and nutritional value of the products they are purchasing. Certification programs, such as B Corp, also help to maintain consumer trust in brands, while nutritional rating systems like Nutri-Score make it easier for consumers to understand the healthiness of a product.

The future of 'better-for-you' snacking looks promising, with a growing emphasis on natural ingredients, local sourcing, and reduced levels of fat, sugar, and salt in foods. Governments are also working with food manufacturers to improve the nutritional profiles of products, without compromising on taste. The key to success in the food industry will be clear and



## Do consumers believe 'better-for-you' marketing on snacks?

By Donna Eastlake  
10-Jun-2024 - Food Navigator

consistent labelling, as well as a continued focus on delicious and innovative flavours that meet consumer demands. Despite these efforts, whether food brands can fully regain consumer trust remains uncertain, but ongoing developments suggest a positive shift in the right direction.

<https://www.foodnavigator.com/Article/2024/06/10/do-consumers-believe-better-for-you-marketing-on-snacks>

## Japanese functional foods businesses legally bound to four new rules from Sep

By Tingmin Koe  
08-Jul-2024 - Food Navigator Asia

Manufacturers of Foods with Function Claims (FFC) are legally bound to four newly added requirements- the latest move in regulating Japan's functional foods industry.

The stringent regulations put in place by Japan's Consumer Affairs Agency are aimed at

ensuring the safety and quality of dietary supplements in the market. By requiring manufacturers to report new scientific findings and cases of health hazards related to their products, consumers can be more confident in the products they are using. The implementation of Good Manufacturing Practices (GMP) will also help to uphold high standards in the production of dietary supplements, further ensuring their safety and effectiveness.

The measures put in place by the CAA also highlight the importance of transparency and accountability in the industry.

By requiring manufacturers to self-inspect and report on their compliance with regulations, the government is working towards creating a more responsible and trustworthy industry. The regulations are a response to the red yeast rice scandal involving Kobayashi Pharmaceutical, underscoring the need for stricter oversight and regulation to prevent such incidents from occurring in the future. Through these measures, the CAA is taking proactive steps to protect the health and well-being of consumers in Japan.

<https://www.foodnavigator-asia.com/Article/2024/07/08/japanese-functional-foods-businesses-legally-bound-to-four-new-rules-from-sep>

The South Korean Ministry of Food and Drug Safety (MFDS) has announced new, stricter regulations governing food product labelling, specifically

prohibiting links to various types of herbal medicines and other health or nutritional claims.

## South Korea drills down on stricter food product labelling laws to avoid 'deceptive' claims

By Pearly Neo 30-Jun-2024 - Food Navigator Asia

The rise in consumer awareness and demand for health and wellness products has created a corresponding increase in the popularity of herbal medicine products like ginseng and traditional tea ssanghwatang. These products, which are regulated differently from regular food items in the country, have captured the attention of consumers seeking alternative remedies and

natural solutions for their health and well-being needs.

In addition to prohibiting misleading labelling and advertising, the ministry has also set out clear guidelines to prevent language or images that violate public morals or social ethics from being used in product marketing. The regulations explicitly forbid the promotion of behaviours like

gambling through food packaging, as well as any attempts to use suggestive content to attract consumer attention. Terms such as 'candy you want to kiss' or 'jelly you want to touch' are strictly prohibited under these rules. <https://www.foodnavigator-asia.com/Article/2024/07/01/south-korea-drills-down-on-stricter-food-product-labelling-laws-to-avoid-deceptive-claims>

## Dairy descriptors: Taiwan drafts new regulations to ensure milk product clarity for consumers

By Pearly Neo  
26-Jun-2024 – FoodNavigator Asia

Taiwanese authorities have drafted a new set of regulations for milk product labelling in the country, in the hope of reducing consumer confusion regarding the various items available on supermarket shelves.

These new regulations by the Taiwanese Ministry of Health

and Welfare are a crucial step towards ensuring transparency and clarity for consumers when it comes to dairy product labels. By clearly defining terms such as 'fresh milk' and 'milk drinks', consumers will be able to make more informed decisions about the products they are purchasing. This will not only prevent confusion but also help in reducing food wastage, as consumers will better understand the shelf life of different dairy products.

In addition to the definitions, the regulations also emphasize the importance of font sizes on product labels. By specifying

the minimum font sizes for different sizes of packaging, the ministry is ensuring that consumers can easily read and understand the information provided on the labels. This will further empower consumers to make educated choices about the dairy products they are buying. Overall, these regulations are a positive step towards promoting consumer welfare and ensuring transparency in the dairy industry in Taiwan.

<https://www.foodnavigator-asia.com/Article/2024/06/26/taiwan-drafts-new-regulations-to-ensure-milk-product-clarity-for-consumers>

While the FSSAI sets the standard for the information that must be displayed by food establishments, individual states may have additional requirements as well.

In the case of Uttar Pradesh, the state government has made it mandatory for food establishments to prominently display the names of key personnel, in addition to any information required by the FSSAI. Failure to comply with these regulations may result in penalties or fines imposed by the relevant authorities. Overall, these measures are aimed at ensuring food safety

and hygiene standards are maintained, and that consumers have access to clear information about the food they are consuming.

In addition to this requirement, the FSSAI also mandates that certain information must be displayed by food establishments for transparency and accountability. This includes the name of the operator, proprietor, manager, and other relevant personnel involved in the business.

By displaying this information prominently, customers are able

## Orders for eateries to display owners' names

Ajoy Sinha Karpuram  
Indian Express October 3, 2024

to identify who is responsible for the food being served to them, as well as who to contact in case of any issues or complaints.

<https://indianexpress.com/article/explained/explained-law/food-safety-laws-in-states-9600890/>



Food labelling and packaging design are critical aspects of the food industry, as they not only provide consumers with essential information about the product but also play a vital role in ensuring food safety and quality.

Government agencies worldwide, like the FSSAI in India, have put in place stringent regulations to govern these aspects and hold food producers accountable for compliance.

Complying with FSSAI labelling standards and obtaining a Food

Business license are essential steps for food producers in India to avoid facing consequences such as fines, penalties, and product recalls. Having a solid understanding of these regulations is crucial for navigating the complexities of food labelling and packaging design to ensure regulatory compliance and maintain consumer trust.

The introduction of specific packaging regulations by the FSSAI highlights the importance of packaging in protecting food from various contaminants and ensuring its safety and quality.

## FSSAI License Regulations on Food Packaging

India Filings September 13, 2024

By adhering to these guidelines, food producers can not only enhance food safety but also extend the shelf life of their products and ultimately contribute to improved food security for consumers.

<https://www.indiafilings.com/learn/fssai-license-regulations-on-food-packaging/>

## Global food regulators summit 2024 concludes with pledge to strengthen food safety

NUFFOODS Spectrum  
23, 2024

India leads the way in strengthening the global food safety ecosystem

Union Minister of Food Processing Industries Mr Chirag Paswan's remarks at the Global Food Regulators Summit underscored the importance of ensuring food safety and

security in the midst of evolving global challenges. His emphasis on exploring ways to enhance the value of food highlights the need for continuous innovation and improvement in the food industry. His praise for the diversity of India's food systems serves as a reminder of the country's rich culinary heritage and the potential for unlocking new opportunities in the sector.

Member of Niti Ayog Dr. V K Paul's endorsement of the Eat Right India movement showcases the importance of promoting healthy eating habits and fostering behavioural change among consumers. The Regional Conclave hosted by

India further signals the country's commitment to fostering collaboration and harmonization within the international food regulatory landscape. By providing a platform for Asian countries to address unique challenges related to food safety, trade, and regulations, the summit sets the stage for meaningful dialogue and cooperation in the region. Overall, the Global Food Regulators Summit serves as a testament to India's leadership in championing food safety and regulatory excellence on the global stage.  
<https://nuffoodsspectrum.in/2024/09/23/global-food-regulators-summit-2024-concludes-with-pledge-to-strengthen-food-safety.html>

The Food Safety and Standards Authority of India (FSSAI) has proposed amendments to the Food Safety and Standards (Import) Regulations, 2017.

These draft amendments were published on October 4, 2024. These changes aim to streamline the process of analysing imported food samples and ensure consistency

in laboratory practices. Key Amendments are:  
Method of Analysis: The FSSAI is proposing to update the methods of analysis used for testing imported food samples. While the Authority's manuals will remain the primary reference, food laboratories will now have the flexibility to adopt validated methods prescribed by internationally

## FSSAI Proposes Amendments to Food Import Regulations

Legality Simplified  
October 8, 2024

recognized organizations like AOAC, ISO, Pearson's, Jacob, IUPAC, Food Chemicals CODEX, BIS, Codex Alimentarius, Woodmen, Winton-Winton, or Joslyn. This adoption is permitted only in those circumstances when the any parameter is not available in the manual of the FSSAI.

Laboratory Report Submission: It is also proposed that the

director of notified laboratories or referral laboratories can be the authorised signatory on analysis reports. This is in addition to the authorised Food Analyst of the laboratory. This will expedite the import clearance process.

The FSSAI has invited comments and suggestions on these proposed amendments. Stakeholders can submit their

feedback by December 3, 2024. These changes are expected to improve the efficiency of food import procedures and ensure that imported food products are analysed using accurate and internationally recognized methods.

<https://www.legalitysimplified.com/fssai-proposes-amendments-to-food-import-regulations/>

## Draft Food Safety and Standards (Contaminants, Toxins and Residues) Amendment Regulations, 2024

Legality Simplified September 24, 2024

The Food Safety and Standards Authority of India (FSSAI) has proposed amendments to the Food Safety and Standards (Contaminants, Toxins and Residues) Regulations, 2011, specifically focusing on pesticide residues.

Key Changes Introduced by the Draft Amendment  
The term "insecticide" has been aligned with the

definition provided in the Insecticides Act, 1968. The use of pesticides or insecticides directly on food articles is generally restricted. However, fumigants registered under the Insecticides Act are exempt.

A tolerance limit of 0.01 mg/kg has been set for pesticides/insecticides not registered under the Insecticides Act, except for spices and culinary herbs, which have a tolerance limit of 0.1 mg/kg. A table specifying maximum residue limits (MRLs) for certain pesticides/insecticides in specific food items has been introduced.

These amendments aim to ensure that pesticide residues in food products are kept within safe limits, protecting public health. The revised regulations will provide clearer guidelines for food businesses and regulatory authorities regarding the use and monitoring of pesticides.

The FSSAI has invited comments and suggestions on these draft regulations. Interested stakeholders can submit their feedback by November 22, 2024. This feedback shall be provided on FSSAI's e-platform for comments in the prescribed format.

<https://www.legalitysimplified.com/draft-food-safety-and-standards-contaminants-toxins-and-residues-amendment-regulations-2024/>

## South Korea mandates food firms to indicate portion reductions and sweetener usage on product labels

By Pearly Neo 06-Aug-2024 -Food Navigator Asia

The South Korean government has announced new regulations mandating food and beverage firms to indicate portion size changes and any sweetener usage on their product labels.

These new regulations implemented by the Ministry of Food and Drug Safety (MFDS) aim to provide consumers with more transparent and accurate information regarding the products they purchase. By requiring companies to clearly state any changes in product content, such as shrinkflation tactics or the use of sweeteners in

'sugar-free' products, consumers will be able to make more informed choices about what they are consuming. The emphasis on highlighting the presence of sweeteners and calorie information in products is especially important in promoting healthier eating habits and preventing any misunderstandings for consumers.

Furthermore, the standardisation of printing fonts for alcohol product



caloric information will make it easier for consumers to understand the number of calories they are consuming when drinking alcohol. By making this information more visible and accessible, the MFDS hopes to encourage moderate

and responsible drinking habits among consumers. Overall, these new regulations demonstrate the government's commitment to protecting consumer rights and ensuring a safe and transparent food consumption environment for

all.

<https://www.foodnavigator-asia.com/Article/2024/08/06/south-korea-mandates-food-firms-to-indicate-portion-reductions-and-sweetener-usage-on-product-labels>

## Thailand announces new pre-packaged food labelling regulations mandating clarity and manufacturer responsibility

By Pearly Neo 07-Aug-2024 - Food Navigator Asia

The Thai government has announced the enforcement of new labelling regulations for pre-packaged food products that emphasise increased information clarity for consumers as well as mandating the inclusion of manufacturer information.

The revamped regulations set forth by the Thai FDA aim to prioritize consumer safety and

Foods that do not contain novel DNA will not be considered genetically modified, even though they may have been processed via new breeding techniques, according to new proposals from Food Standards Australia New Zealand (FSANZ).

The regulatory authority has issued a second call for public comments on proposed changes that will impact how genetically modified (GM) foods are defined in the Australia New Zealand Food Standards Code. With new techniques for genetic modification emerging, including genome editing, cisgenesis, and intragenesis as part of the umbrella

ensure transparency in the food industry. By requiring food manufacturers to take responsibility for providing accurate and clear information on their products, consumers can

make informed decisions about what they are consuming. This move aligns Thailand with other countries in the region that have also updated their pre-packaged food labelling regulations in recent years.

The emphasis on allergen warnings and expiry dates is crucial in protecting consumers, especially those with food allergies or sensitivities. With clear and

concise messaging required on product labels, individuals can easily identify potential allergens and make informed choices about what they eat. The strict guidelines set by the Thai FDA ensure that all pre-packaged food and beverage products sold to consumers meet the necessary standards, enhancing food safety and transparency in the market. This proactive approach by the Thai FDA showcases their commitment to safeguarding public health and ensuring the well-being of consumers in Thailand.

<https://www.foodnavigator-asia.com/Article/2024/08/07/thailand-announces-new-pre-packaged-food-labelling-regulations-mandating-clarity-and-manufacturer-responsibility>

category of New Breeding Techniques (NBTs), FSANZ CEO Dr Sandra Cuthbert stressed the need for updated regulations to keep pace with these advancements. Following feedback from stakeholders on an initial proposed hybrid approach, FSANZ has now shifted its focus to an outcomes-based definition centred on the presence of novel DNA in the organism, rather than changes to the food itself.

The proposed changes aim to provide clarity and objectivity in determining whether a food should be classified as GM under the Code, while also exempting certain NBT foods

## New definition for GM foods in ANZ: Officials propose only those containing novel DNA be considered genetically modified

By Audrey Yow 27-Aug-2024 - Food Navigator Asia

from pre-market assessment and approval if they are deemed equivalent in characteristics to conventionally derived foods. Despite concerns raised by consumer advocacy groups over the safety of NBT foods,

FSANZ maintains that extensive testing is not necessary for these foods if they are shown to present the same low risk as conventional foods. By adopting an approach that accounts for technology developments and

potential risks associated with genetic modifications, FSANZ seeks to establish a stable and flexible framework that will adapt to evolving food production methods and uphold safety standards in the industry.

<https://www.foodnavigator-asia.com/Article/2024/08/27/new-definition-for-gm-foods-in-anz-proposal-for-only-those-with-novel-dna-to-be-called-genetically-modified>

## FDA Phase II sodium reduction goals could reduce daily intake by 20% in 3 years

By Elizabeth Crawford  
20-Aug-2024 -Food Navigator USA

US FDA is asking packaged and prepared food manufacturers to further slash sodium in their products over three years to help Americans reduce their daily intake of the nutrient by 20% as part of a larger, multi phase effort to reduce diet-related diseases associated with overconsumption of sodium.

Last week, the FDA unveiled its much-anticipated draft guidance outlining voluntary Phase II sodium reduction targets for 163 commercially processed, packaged, and prepared food categories. These targets are seen as a crucial step in building on the agency's previous efforts to reduce sodium intake in the American diet, which have so far fallen short of the mark.

While the agency characterizes the voluntary Phase II goals as "achievable reductions" that consider food safety, consumer acceptance, and align with public health goals, industry is facing the challenge of taking larger steps in certain categories that have not yet met Phase I targets.

According to preliminary data shared by FDA, only about 40% of food categories have reached or are very close to reaching the sodium reduction targets set in 2021 for April 2024, aimed at reducing average daily sodium intake from around 3,400 milligrams to 3,000 milligrams.

The positive momentum in sodium reduction efforts from 2010 to 2022 has been a source of encouragement for both the FDA and public health advocates. The progress made towards the Phase I targets in October 2021 is a promising indication of the industry's commitment to improving the health of consumers by lowering sodium levels in the food supply.

Alongside the efforts of the agencies mentioned above, the FDA has outlined Phase II goals

that are aimed at complementing ongoing initiatives to reduce sodium intake and combat diet-related diseases. These goals align with the broader National Strategy on Hunger, Nutrition, and Health from the White House, which emphasizes the importance of facilitating sodium reduction in the food supply through voluntary targets for industry.

Looking ahead, the FDA has indicated that future phases of sodium reduction targets will be incorporated into their evaluation and monitoring efforts to track progress in the marketplace and population-level sodium intake.

Furthermore, the agency has previously taken steps to support sodium reduction by proposing a rule that would allow for the use of salt substitutes in foods that require or allow for salt, and by encouraging manufacturers to use the more consumer-friendly term "potassium salt" in place of "potassium chloride."

<https://www.foodnavigator-usa.com/Article/2024/08/20/fda-phase-ii-sodium-reduction-goals-could-reduce-daily-intake-by-20-in-3-years>