

PFNDAI

# FOOD, NUTRITION & SAFETY MAGAZINE

BULLETIN AUG 2023

## LABELLED INFORMATION IS TRUSTWORTHY BUT CAN IT WITHSTAND SOCIAL MEDIA POSTS

Dr Joseph I Lewis

### INCLUSIVE LABELLING (BRAILLE):

A POSSIBLE SOLUTION TO  
HIGH IMPACT SOCIAL  
PROBLEM IN INDIA

Mr Zafar Khan

### WHOLE WHEAT BREAD A HEALTHIER CHOICE!

Ms. Dipti Saudagar

### CARBOHYDRATE METABOLISM KINETICS FOR ENERGY UTILIZATION

Dr Ramesh Prajapati

### FRUCTO- OLIGOSACCHARIDES: MYTHS AND FACTS

Dr Priyali Shah & Dr Shashank Bhalkar

PROTEIN FOODS AND  
NUTRITION DEVELOPMENT  
ASSOCIATION OF INDIA

2nd Floor, Mahalaxmi Chambers, 22 Bhulabhai Desai Rd., Mumbai - 26 (India)

Phone: 022 23538858 / 23519014

Email: [pfndai@pfndai.org](mailto:pfndai@pfndai.org) Website: [www.pfndai.org](http://www.pfndai.org)



Fibers for Life.



# VITACEL<sup>®</sup> Citrus Fiber

Highly Functional Properties that Enhance  
Texture and Deliver Health Benefits



## Versatile Dietary Fiber

- › Sustainable production
- › Consumer-friendly labeling
- › High dietary fiber content
- › Smooth and highly viscous texture

**RETTENMAIER INDIA PVT LTD**

B/816, Lodha Supremus- II, Wagle Estate, Thane (W)- 400 604 Maharashtra, India  
Phone: +91-22-40243817/ 21, Meeta.Raheja@jrsindia.com, Rasika.Nachane@jrsindia.com

[www.jrsfood.net](http://www.jrsfood.net)



*taste stimulate the secretion of digestive juices  
this pleasant experience provide mouth watering...  
indication of enjoyment of food*

*taste is a valued concept in food..... creating consumer appeal  
through taste is our speciality*



*We work intimately with the nature in creating unique, innovative functional flavour systems that excite the palate - taste and create new sensations to all processed foods and beverages that goes a long way in market success and creating brand value.....*

**FOOD INGREDIENT SPECIALITIES PRIVATE LIMITED**  
No. 90, Vanagaram - Ambattur Road, Ayanambakkam,  
Chennai - 600 095. India



Where science  
& creativity meet

## THE FUTURE OF TASTE, FOOD & BEVERAGE BEGINS HERE

At IFF we are transforming our industry through the design of better products, building on our heritage of creating sense experiences with the addition of world changing scientific expertise and R&D.

We are your partner for essential solutions, guided by a customer-centric approach in everything we do. Applying science and creativity for a better world. It's time to discover the IFF difference.

Learn more: [www.iff.com](http://www.iff.com)





**Circulated to PFNDAI Members Only**

PFNDAI is not responsible for the authenticity and correctness of the information published and the views expressed by the authors of the articles.

Email : pfndai@pfndai.org Website : www.pfndai.org

# EDITORIAL BOARD

Dr. Gupte Swati, Dr. Holla K.S., Dr. J.I. Lewis, Dr. Udipi Shobha,  
Dr. Shirhatti Vilas, Mrs. Madhavi Trivedi, Dr. Bhajekar Deepa  
Dr. Jagmeet Madan, Dr. V. Krishnakumar & Dr. B. Sesikeran

# INDEX



**COVER STORY 1**

Editorial

Scientific Perspective By Dr Sesikeran

Regulatory Viewpoint By Dr Lewis

Labelled Information Is Trustworthy ..... 1  
but Can It Withstand Social Media Posts  
By Dr Joseph I Lewis

Whole Wheat Bread a Healthier Choice! ..... 7  
By Ms. Dipti Saudagar

Carbohydrate Metabolism Kinetics ..... 13  
for Energy Utilization  
By Dr Ramesh Prajapati

Inclusive Labelling (Braille): ..... 21  
A Possible Solution to High Impact Social Problem in India  
By Mr Zafar Khan

Fructo-oligosaccharides: Myths and Facts ..... 25  
By Dr Priyali Shah & Dr Shashank Bhalkar

Regulatory Round Up ..... 30  
By Dr Shashank Bhalkar

Research in Health & Nutrition ..... 32

Food Science and Industry News ..... 41

Regulatory News ..... 52

JRS India,  
IFF,  
Food Ingredient Specialities,  
Bee Pharmo Labs,  
Vasta Biotech,  
Marico,  
Fine Organic Industries Ltd,  
Samyog Health Foods,  
Mondelez,  
Synergia,  
Roha Dyechem Pvt Ltd,  
Zydus Wellness,  
Tata Chemicals &  
Modern Dairies

**ADVERTISERS**

# GOVERNING BOARD

ELECTED MEMBERS:

Mr Indranil Chatterjee, IFF  
Mr Rohit Raut, JRS  
Mr Clifford Pinto - Roquette  
Dr Bhavna Sharma, ITC  
Mr Rajesh Kamat, Tata Chemicals  
Dr Palaniyamma Durairaj, Amway  
Mr Prashant Bhat, Mother Dairy  
Dr Dhruvi Bal, Britannia  
Dr Vaibhav Kulkarni, Abbott

CHAIRPERSON: Dr Shatadru Sengupta, Hardcastle Restaurants  
VICE CHAIRPERSON: Mr Nikhil Kamat, Fine Organics  
HON TREASURER: Dr Prabodh Halde, Marico  
ADVISOR: Dr. B. Sesikeran, Chairman, Scientific Advisory Committee, PFNDAI

CO-OPTED MEMBERS:  
Ms Rini Sanyal, Herbalife  
Dr Sujata Jayaraman, HUL  
Dr Govindarajan R, Zydus  
Mr Varinder Jaswal, Mondelez  
Mr Dinesh C Pandey, Dabur  
Mr Swarn Singh, Kellogg

CO-OPTED PAST CHAIRMEN:  
Mr Bhupinder Singh, Vista  
Processed Foods  
Dr. Joseph Lewis, ex-Marico  
Dr GM Tewari, ex-Coca Cola  
Mr RD Shenoy, ex-Cadbury  
Mr JA Sakhavalkar, ex-Novartis

# EXPLORING IDEAS OF STUDENTS FOR PRODUCT DEVELOPMENT

Indian food industry has grown tremendously in the last couple of decades, from just bread, biscuits, soft drinks, jams & jellies companies to health food drinks, ready mixes etc. to now a wide range of foods of all types for various occasions to different consumer demands.

Thus there is a tremendous pressure on companies to keep up with the new demands with newer products. Again, not all products succeed and there is a large failure rate also. However, only when one tries again and again, the failures then turn into success.

There are demands both from the consumers as well as from health professionals for nutritious and healthier food products. Thus companies are always looking for new ideas. Fortunately, the net is useful in this respect as people post on kinds of ideas on the net and especially on social media. There is actually a boom of ideas, so it is really difficult to get the suitable ideas unless one goes through literally thousands of posts.

One way of getting some really good ideas is asking students of nutrition and food technology courses to prepare some products. The company with dairy interest may put the precondition that the product must have dairy ingredients as the major ones.

They can also put some other guidelines depending on their requirements so they get many ideas which either could be directly tried or with some modification could be developed into new products.

Students are quite resourceful. They not only have the basic knowledge of food science and nutrition but also many other inputs which are necessary for developing a new products. They also have access to library and they are quite savvy of how to search the information on net and also how to present their ideas using modern audio-visual aids with many apps. They are also quite resourceful in preparing a product sample. Since they are youthful they are not afraid of failures.

In some places, companies regularly keep in contact with institutions for professional advice as well as ideas from students as well as teachers. Companies can also have non-disclosure agreement to keep these ideas safe. Thus, industry can not only explore a large number of ideas, this practice would be highly cost-effective.

Prof Jagadish Pai,  
Executive Director, PFNDAI



# Veg DHA Omega-3 Throughout the Life Cycle



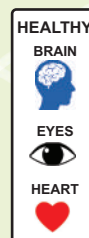
100% Veg  
DHA  
Powders  
& Oils

## *life's* DHA™ – Veg DHA Omega-3

Health and wellness throughout life

### *life's* DHA™ Supports:

- A healthy pregnancy in mothers to be
- Brain and eye development for foetuses, infants and children
- Cardiovascular health in adults
- Mental health in senior citizens



### Also from Vasta:

**Lactoferrin** for ID/IDA and for immune health; **Nucleotides** for infant nutrition; **Phosphatidylserine** for cognition; **Taurine** for alertness and energy; **Nisin & Natamycin** for shelf life extension; **Folic Acid** for well being... and many other ingredients!



## Vasta Biotech Pvt. Ltd.

M: +91 98416 03903

T: +91 44 24993095 • F: +91 44 24991007

vasta@vastabiotech.com • www.vastabiotech.com



# FOOD FOR THOUGHT OR THOUGHT FOR FOOD



AUTHOR

**Dr B Sesikeran,**

Former Director,  
National Institute of Nutrition (ICMR)  
Hon. Scientific Director, PFNDIA

Many of us as nutritionists are always looking for reliable indicators of malnutrition and evidence of effectiveness of an intervention that would give the best favorable outcomes. For example, reducing the prevalence of stunting, bringing down the BMI in individuals or lowering the Glycemic load etc.

These interventions will be based on cumulative wisdom from all published research. Based on such reviews when a policy initiative is to be brought out by the policy makers, we may still not understand the magnitude of investment into the intervention and how to quantify the benefits in monetary terms. We need to learn to equate a public health intervention to a product development wherein profits over time are weighed against the investment.

I would suggest that we read the World Bank publication “An investment framework for Nutrition (<http://dx.doi.org>) by Meera Shekar, Kakietek.J, Eberwein JD and Walter D. They look at the cost benefit analysis that weighs the cost of an intervention against its benefits in economic terms. For example, \$1 invested to promote the rates of exclusive breast feeding has been estimated to have given \$35 in return. Similarly, a \$1 investment in prevention of anemia in women will give a benefit of approx. \$12.

If we were to make a similar analysis on NOT investing and measure the benefits, that would be interesting too. An example of such a research study can be seen in the publication of Thomas et al. in Int J Behav Nutr Phys Acta 2022. London transport network in 2019 stopped all ads of foods belonging to the High Fat, Salt, Sugar (HFSS) category and would have

incurred a loss in revenue. They compared with the transport network in North of England where such ads were permitted. A health economic modelling was used to predict the outcomes. The analysis estimated the effect in a population of 71.5 Lakh individuals over the age of 16 yrs and a period of 3 years.

A random sample of about 2000 households (HH) with an average of 2.6 members per HH, were surveyed and recorded for all food and drink purchased. The results gave an estimate of 4.8% fewer individuals with obesity (94,867 persons) with a reduction in incidence of diabetes and cardiovascular diseases in this population within 3 years post the London transport policy intervention.

The authors further estimated that it added 16,394 quality adjusted life years and saved 218 million pounds towards their health and social care costs which would have been many times greater than the revenue losses to the transport agency. Nutrition either way is an investment in human capital and the spin off benefit is that the profits are not even taxable.





Kick start your day with  
essential nourishment.  
**Enrich with Natural Vitamin K2-7**



**MenaquinGold<sup>®</sup>**  
Natural Vitamin K2-7



**Give your  
breakfast a Boost  
of Energy**



For further information please contact:

**Synergia Life Sciences Pvt. Ltd.**

1503, Universal Majestic, P. L. Lokhande Marg, Ghatkopar-Mankhurd Link Road, Govandi, Mumbai – 400 043,  
Email : [info@synergialifesciences.com](mailto:info@synergialifesciences.com), Website: [www.synergialifesciences.com](http://www.synergialifesciences.com) / [www.menaquingold.com](http://www.menaquingold.com)



# GOOD REGULATORY PRACTICE



AUTHOR

**Dr Joseph I Lewis,**  
Chairman, Regulatory Affairs,  
PFNDAI

Right to make a regulation is not the purpose of the Act: making the right regulation is. For this to happen, diligent pre-work u/s 18 is necessary before regulations are made under powers conferred by section 92. Sec. 18 requires that any measure (i.e., standard or regulation) taken *“shall be proportionate and no more restrictive of trade than is required to achieve appropriate level of health protection, regard being had to technical and economic feasibility and other factors regarded as reasonable and proper in the matter under consideration”*. Rulemaking under modern science based regulatory systems are based on good regulatory practice.

Every FBO knows the meaning of ‘good practices’ in production, manufacturing and processing. They are obligated to follow Good Agricultural Practice (GAP), Good Manufacturing Practice (GMP), Good Hygiene Practice (GHP), Good Laboratory Practice (GLP) to obtain a quality product or a license or stay

in compliance. Just as businesses are obligated, likewise too, Section 18 expects the regulator to follow good regulatory practice (GRP). Essentially good practices are about self-control and transparent operating systems. FBO’s readily demonstrate GMP during walk around inspections on the shop floor.

One can find several descriptions for Good Regulatory Practice (GRP). It is a formalized, mandatory, whole-of-government policy, that defines the common and transparent rules by which regulatory agencies develop technical regulations for all regulated sectors. It provides a quality control mechanism for development of regulations, ensuring that rules made are relevant, of the highest quality, cost-effective, internationally aligned and least economically restrictive amongst alternatives of the same purpose. The emphasized terms resonate with the requirements u/s 18.

The ‘whole of government’, quality control mechanisms (read GRP) and international alignments (read harmonization) are necessary factors of pre-work. The whole of government approach expects greater inter-

departmental coordination to deliver seamless services to businesses. The government intended this by integrating the rulemaking functions of several ministries and departments, under a single entity, the FSSAI. It succeeded in doing so to an extent but did not end the duplicating or overlapping of standards. BIS standards are drawn from FSS; Legal metrology’s unique selling proposition overlaps emphasized ingredient declarations. Even when couched or wrapped in language, the principle of rules should be obvious to those who make them.

Secondly independent quality control mechanisms should check whether drafts comply the provisions of Section 18. Independent assessments work better than internalized hierarchical systems, where authors review their own work. Requirements under the section are mandatory to ensure that high quality and cost-effective measures are implemented. Pre-work u/s 18 is not to be confused or mistaken for ‘notice and comment’ periods which is post drafting. Finally, only a comprehensive understanding of a science-based Act, can deliver the processes by which rules are to be made. Science has a premier place and function in most modern regulatory systems, on which rules are made. Using such approaches adopted by Codex and FSSA serve as reference points of harmonization. Good regulatory practice alone will ensure making the right regulation.



# SAVOR THE VIBRANT COLORS OF INDIA

## WITH EVERY BITE!

This Independence Day, let ROHA help you infuse the spirit of our tri-color in your culinary creations.

Paint your recipes with a splash of our beta-carotene-based orange, experience an eternal calm with our NIVEOUS white, cherish the freedom with our spirulina-based blues, and taste the nature herself with our chlorophyll-based greens.

With ROHA, truly experience the tri-color in every bite.

TO EXPLORE MORE, MEET US AT FI INDIA, MUMBAI  
AUGUST 17<sup>TH</sup> - 19<sup>TH</sup>, 2023 | BOOTH C38

FOOD COLORS



DRIED INGREDIENTS



INDUSTRIAL COLORS



# LABELLED INFORMATION IS TRUSTWORTHY BUT CAN IT WITHSTAND SOCIAL MEDIA POSTS



**AUTHOR**  
Dr Joseph I Lewis,  
Chairman, Regulatory Affairs,  
PFNDAI

The Authority considered the most trusted source and custodian of food information, needs a communication strategy to protect consumers right to informed choice. For foods, protection is required in two settings; labelling and social media.

Consumers make conscious decisions all the time throughout life. In the case of foods, consumer autonomy to purchase and consume a food is based on informed choice. The purchase is not made blindly, but on what is declared on the label. Informed choice considers many factors other than nutrition, such as sensory expectations (sweet, spicy, tangy) ethical and environment concerns (vegan, organic) and special dietary needs (infant formula). Label information is trustworthy, as it is based on nutrition science, legislated and overseen by law. Now that food labels are discussed on

social media, content posted competes with labelled information. Consumers rightly expect sources other than a legally compliant label to be equally trustworthy. When labelling is not perfectly understood by many, more than one source of information makes consumers vulnerable. There is also reasonable expectation that experts and scholars would take to social media to help them decipher the truth. To stay away is to abandon them to misleading opinions and false narratives.





# A WORLD OF NUTRITION & WELLNESS

CASEIN | WHEY PROTEIN CONCENTRATES | LACTOSE



Modern Dairies is a leading dairy manufacturing company since 1993. The plant facilities are state-of-the-art and the company has a strong technical background, operated by a highly competent and motivated team of professionals.

Modern Dairies has one of the largest facilities for Casein, Whey Proteins and Lactose - Pharma Grade. The Company's Quality Management System has been certified by DNVGL Netherlands for updated version of ISO 9001, FSSC 22000 and ISO 14001. The facilities are approved and registered with USFDA, Export Inspection Agency & APEDA for supply of its products in the international market. NutriLac Pharma Grade Lactose confirms to the international standards of USP, BP & IP.

## A Snapshot of our Customers



Disclaimer: All product names, logos and brands are property of their respective owners. All company, product and service names are for identification purposes only. Use of these names, logos and brands does not imply endorsement.

### MODERN DAIRIES LIMITED

Corporate Office : #98-99, Sub-City Centre, Sector 34, Chandigarh - INDIA  
Works : 136 KM, G.T. Road, Karnal - Haryana  
www.moderndairies.com | Email : info@moderndairies.com

®: Registered Trade Mark, TM: Trade Mark, Owners: Modern Dairies Ltd.



Food law generally deals with mislabelling, misbranding and misleading claims: it is product centric. Misinformation and disinformation is about false narratives in all forms of media. Disinformation is distributed with the intent to cause harm, whereas misinformation is the mistaken sharing of the same content (1). Those who post feel an urge to warn people about a health issue by “choosing information” to connect with them. The post involves taking bits and pieces of information from authoritative sources - like food labels; and place them out of context to suit the readership they serve. Content is merely fashioned for the constituency. It is fair to say because labelling is confusing and insensitive to consumer needs; it offers a fertile ground for disinformation.

People posting are not necessarily looking to provide better information than the label, they are seeking recognition measured by the “likes, comments and forwards” the post generates. To get “liked” there has to be a compelling and attractive narrative. Ever since fake news acquired certain legitimacy on being named word of the year, consumers are increasingly tasked with

searching for the truth. Which of the two, labelling or social media are more capable of better connection with consumers?

This article is not about whether posts are accurate or trustworthy. It is to understand the characteristics of online spaces powered by people’s need for connection, community, and affirmation (1). At a very general level, an autonomous choice is a voluntary action, not being forced upon one by external conditions, decisions, choices, and actions, and which implies independence from others or from others’ views or preferences (2).



Are communication capabilities compared for message retention, whether through labelling or social media? In terms of outcomes, both are communication platforms. One is static, the other very dynamic. One is believable the other, not easily understood. One gets instant feedback, the other discourages it. If this is so, authorities and food experts should be concerned with the lack of an overall communication strategy for better informed choice. Silence and slowness of expert response only encourages false spread. Open communication platforms are equitable with space for all, much like a marketplace. Why is expert

communication so conspicuously unavailable?

Much of what needs to get onto social media - whether its high sugar and health or non-nutritive sweeteners in weight loss - is in the domain of risk communication. And it is an integral part of the Food Safety and Standards Act. Section 3zp states “risk communication means the interactive exchange of information and opinions throughout the risk analysis process concerning risks, risk-related factors and *risk perceptions, among risk assessors, risk managers, consumers, industry, the academic community and other interested parties, including the explanation of risk assessment findings and the basis of risk management decisions*” (emphasis provided).



While the ambit to engage publicly is clear, online narratives are believable only because they are colloquial and engaging. Institutions are handicapped by language and style, and therefore less suited for people’s needs. Another thing is, online platforms are democratic - inviting two way exchanges. Feedback is instant.







## FOOD PRODUCT TESTING SERVICES

We are Govt approved testing laboratories by FDA  
Our test facilities are accredited by NABL[ISO/IEC 17025:2017] & ISO certified(9001:2015) by EURO VERITAS  
Our lab has been approved by FSSAI, BIS, APEDA



### We Can Undertake Following Food Categories for Analysis

#### Products

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

#### Testing as per FSSAI requirements.

- Pesticide residues, PAH, PCB's
- Mycotoxins
- Naturally occurring toxins(NOT,s)
- Heavy metals and minerals
- Minerals & Toxic heavy metals
- Vitamins
- Antibiotics / Residues
- Food Adulteration tests
- Food additives, preservatives and artificial sweetners
- Synthetic food colour
- Antioxidants
- Packaged Drinking analysis as per IS 14543
- Drinking water as per IS 10500
- Process water IS 4251
- Shelf life study(Ambient @ Accelerated)
- Microbiological testing (Bacterial and pathogens)
- Hygiene audit /Kitchen audit
- Allergens
- Sterol Composition

### Analytical Facility

- |                               |  |
|-------------------------------|--|
| 1) GC MS MS                   | 7) Ion Chromatography with CD            |
| 2) LC MS MS                   | 8) Protein / Fat / Fibre Analyzer        |
| 3) ICP MS                     | 9) Elisa Reader                          |
| 4) AAS/ GF/ Flame             | 10) FT-IR                                |
| 5) HPLC with UV/ FLD/ RI/ PDA | 11) U V Spectrophotometer                |
| 6) HS with GC FID/ TCD        | 12) Partical size by Malvern (Wet & Dry) |

### Bee Pharmo Labs Pvt.Ltd

C-2, Hatkesh Udyog Nagar, Mira Bhayander Road, Mira Road (East), Thane - 401107

Tel: 9029774868 to 9029774877 (10 Lines)

info@beepharmo.com | food@beepharmo.com | www.beepharmo.com



members? Or “why can’t a banana, like an apple a day, keep the doctor away?” - making them wonder what nutrient is missing or present. Perhaps “how many spoons full of sugar am I allowed a day?”

The ongoing debate on sugar has generated greater label interest than otherwise. Quick to follow is the disinformation on non-nutritive sweeteners (NNS). The person posting finds occasion to attract attention and is successful when both competent and not so competent respondents participate. It’s a platform characteristic and much is revealed about commentators and comments. Quantity of sugar in a serve of hot beverages is routinely declared. The per capita consumption at 0.2kg (Euromonitor 2015) is also known: both for quite some time. It is now trending on social media and people are keen to understand the health risk being talked about. A prompt risk communication would typically talk of exposure assessment and then characterize the level of health risk posed by the product as low or high. Such a technical response automatically alienates online audiences.

Nutrition and health news needs a new language: moving out of Jurassic Park prose is the first step. What if food frequency consumption is conveyed another way e.g. “you can eat your birthday cake every year and yet keep healthy” or for that matter eat all the cakes of family

for a healthy lifestyle is more helpful that percent daily intake. This would get attention; explanation follows.

Information overload is to be seen as a general problem of informed choice as consumers have a limited amount of attention (2); especially at the time of purchase. Of greater concern is whether labelled information is sufficiently understood to withstand social media posts. Nutrition labelling was introduced in

2008 and daily amounts of nutrients established in 2020. An edible oil product label declares 12-14 nutrients, four of which are zero (Fig). Informing consumers that vegetable oils do not contain protein, carbohydrate, sugar and cholesterol is unlikely to affect purchase.



Declaring compositional amounts of polyunsaturated, monounsaturated and saturated fatty acids in oils, is more suited for a classroom lesson in lipid chemistry than assisting informed choice at purchase or consumption.

<b>Nutritional Information</b>	
(Approximate composition per 100g)	
Energy (Kcal)	900
Carbohydrate (g)	0
Protein (g)	0
Of which sugar	0
Cholestrol (mg)	0
Fat (g)	100
Saturated Fatty Acids, Max.	17
Mono unsaturated Fatty Acids, Min.	14
Poly unsaturated Fatty Acids, Min.	49
Trans Fatty Acids, Max.	2
Added Vitamin A@	2500 IU# / 750 mcg”
Added Vitamin D@	450 IU# / 11.25 mcg”



When oil compositions can be easily googled, why put them on the label. However linking different bits of information can in some cases raise conscious reasoning. Take the case of max. retail price, net quantity and unit sale price.



These declarations are designed for informed choice: larger packs (net quantity) are economically priced (unit price/g) and appropriate for the family. Solus users pay more for smaller packs.

Interference with consumer autonomy to choose can be several. When label information cannot be processed quickly nor aids in decision making, it should be viewed as interference by distraction and confusion.

Far greater is interference from social media. When disinformation goes unchecked, it undermines the credibility of scientists, institutions and government. Public debate happens on open platforms where people get information - or disinformation- to form opinions, modify behaviour, influence government and perhaps shape policy.

Unfamiliarity with modern communication ecosystems widens the gap between scientific knowledge and public understanding. Under these conditions any source that speaks in an engaging manner and offering a glimmer of understanding is followed, whether true or false. If risk communication is emotively posted it will be forwarded "many times".

However it requires developing a communication strategy by Authority, scientific institutions, academics and



consumers. Presenting knowledge cannot be made in the absence of true recipients. While the Authority protects consumer's right to informed choice through compliant labelling, the same right needs protection from misinformed views. If we view open public platforms as classrooms, then scientists and expert groups may be more willing to get on to them.

**Suggested reading:**

1. Wardle, Claire (2023). [Misunderstanding Misinformation](#). Issues in science and technology 39, no 3, 38-40.
2. Coff, Christian. (2014). [Informed food choice](#). Encyclopaedia of Food and Agricultural Ethics.





# WHOLE WHEAT BREAD A HEALTHIER CHOICE!



**AUTHOR**  
**Ms. Dipti Saudagar,**  
 Director, S K Biobiz Food Tech  
 Pvt. Ltd., Nashik, MH  
[dipti@skbiobiz.com](mailto:dipti@skbiobiz.com);  
[www.skbiobiz.com](http://www.skbiobiz.com);  
 M: +91 9892391527

which is rich in dietary fiber. The bran and germ contains essential vitamins and minerals such as B vitamins (thiamine, riboflavin, niacin, and folate), magnesium, calcium, potassium, zinc and iron. These nutrients are often removed or significantly reduced during the refining process of white flour. It mainly consists of starch from the wheat endosperm. As a result, whole wheat flour provides a more diverse and nutrient-rich profile.

Despite Indians becoming more health conscious, white bread continues to dominate the market with an approximate 75% market share. While demand for whole wheat, brown and nutritional breads is expected to grow, this segment currently accounts for a mere 20% of the total share.

### Nutritional Benefits of Whole Wheat Bread

Whole Wheat Bread is a better choice compared to white bread due to additional fibers, vitamins such as folic acid, B6, E and minerals content in it.

The whole wheat flour contains the bran and the germ part of the grain,

### Bread Industry Growth

Do you know an average Indian family, spends Rs. 400 to Rs. 800 each month on breads? Bread is thus becoming a regular food in the Indian diet. Bread is consumed in different formats, like loaf, bun, pav, pizza and artisanal breads like multigrain, focaccia, ciabatta etc. It is consumed almost at all eating occasions throughout the day including tea time, breakfast, lunch, evening snack and dinner.

The bread industry in India, is estimated to be around \$1000 million in FY2023 and its growing at the CAGR of 7 to 8%. Over the years, increasing disposable incomes, urbanization, and changing consumer preferences and lifestyles have given a boost to the bread industry.

Below table compares nutritional values per 100g of whole wheat flour (atta) and refined wheat flour (maida):

Nutrients	Refined Wheat Flour (Maida)	Whole Wheat Flour (Atta)
Calories, kcal	364	340
Carbohydrates, g	76.3	71.2
Protein, g	10.3	12.7
Fat, g	1.2	1.7
Dietary Fiber, g	2.7	12.2
Calcium, mg	15	34
Iron, mg	4.2	3.6
Magnesium, mg	18	138
Potassium, mg	33	363
Zinc, mg	0.4	3.9
Vitamin B6, mg	0.1	0.3
Vitamin E, mg	0.2	0.5
Folate, mcg	8	44



# 50g **PROTEIN** per pack

Try our Tasty & High Protein Prolicious Millet Dosa



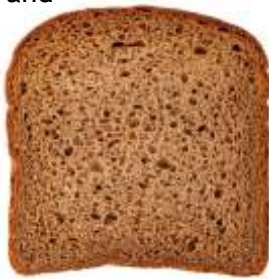
A delicious & healthy spin to your meal

- High protein
- High fibre
- Millet based
- Plant based
- Easy to cook



Whole wheat flour has lower glycemic index (GI of 69) compared to refined wheat bread (GI of 75). The glycemic index measures how quickly carbohydrates are digested and raise blood sugar level. Whole wheat flour contains more complex carbohydrates, which are digested more slowly, leading to a slower and steadier release of glucose into the bloodstream. This can help regulate blood sugar levels and provide sustained energy.

Whole wheat flour contains phytochemicals and antioxidants such as lignans and phenolic compounds. These molecules have been linked to a variety of health benefits, including a lower risk of heart disease, certain cancers, and inflammation. Lignans, in particular, may be beneficial in the prevention of hormone-related malignancies such as breast and prostate cancer.



Thus bread made from whole wheat flour is more nutritious than made from refined wheat flour.

However making whole wheat bread presents several challenges compared to traditional white bread.

### Challenges of making Whole Wheat Bread

**1. Dough Consistency:** Whole wheat flour contains more bran and germ compared to refined wheat flour. As a result, the dough may have a coarser texture and be less elastic, making it harder to handle and shape.

**2. Rising properties:** Gluten, is a protein composite in flour, provides the elasticity and structure necessary for bread to rise and hold its shape during baking. Gluten structure may not develop adequately in whole wheat flour due to higher bran content and may hinder the strong gluten structure development and hence the rising or oven spring.



**3. Consumer preference and familiarity:** Refined wheat flour has long been the standard in bread-making, and its taste and texture are familiar to consumers. Consumers have developed a preference for the soft, tender texture and mild flavour associated with white bread. This familiarity and preference drive the continued use of refined wheat flour in commercial and artisanal bread production.



**4. Shelf Life and Staling:** The higher oil content in whole wheat flour, makes it more prone to rancidity, leading to off-flavoured bread over shelf life. Whole wheat bread may also stale faster due to the bran and germ particles absorbing moisture from the bread, making it dry and less palatable. Thus whole wheat bread tends to have a shorter shelf life than white bread. This leads to higher logistics cost and market returns for whole wheat bread for a Baker.

**5. Baking Time and Temperature:** The presence of bran and germ in whole wheat flour can affect the baking time and temperature. Whole wheat bread often requires a slightly longer baking time at a lower temperature to ensure proper baking without burning the crust.





# Maximized consistency & extended stability in fat spread, peanut butter and chocolate spread

FINE specialty additives for oil binding applications



Delicious fat spreads are one of the most popular food items that find almost a permanent place on our breakfast plates and dining tables. These products are typically a complex matrix of various components such as oil phase, water, and air. The presence of free oil, either inherent or added on-purpose, pose a critical challenge in the form of potential phase separation. This may result in immediate consumer rejection; because, the presence of separated oil layer is perceived as the sign of inferior product quality and/or of deterioration of the food product.

FINE specialty oil binder & stabilizer **Finamul 9106** has been formulated with the focus on maximizing the oil binding properties and stabilization in order to maintain the physical integrity of the product during long storage & shipment.



Key technical features	Benefits
Non-GMO & based on vegetable oil	Excellent functionality: Minimizes/prevents oil separation
Suitable stability at elevated temperatures	Effectively stabilizes the formulation
Low saturated fat solution	Protects the integrity of food matrix/compound
Ease in application and storage	Enhanced customer appeal; thereby, higher acceptance
Extended shelf-life	Improved overall quality of food

## Key applications:

• Fat spread & margarine • Peanut butter • Chocolate spread • Chocolate paste • Tahini

**Finamul 9106** can be used in combination with **Finamul 90** fat dispersing agent and **Finamul 2402** viscosity modifier in order to achieve a synergistic effect to maximize the product consistency and render excellent spreadability to your product while finely preserving the sensory profile.

Select a befitting speciality food ingredient for your food formulation with us at: [food@fineorganics.com](mailto:food@fineorganics.com).

We look forward to connecting with you and can host technical webinars to specially address your requirements.

Disclaimer: Information given herein is in good faith but without guarantee since the conditions of use of the product are not in our control. Fine Organic Industries Ltd & it's associate companies expressly disclaims any responsibility for the suitability of the products for any specific or particular purposes by the user and does not assume any liability or risk involved in the use of its products. We recommend that the actual user make tests to determine the suitability of a product for their particular application prior to use. User should refer to SDS and other relevant data for safe handling. The user of the products is solely responsible for compliance with all laws and regulations applying to the use of the products, including intellectual property rights of third parties.

Tel: +91 (22) 2102 5000 Extn. 100

Email: [food@fineorganics.com](mailto:food@fineorganics.com) | Web: [www.finorganics.com](http://www.finorganics.com)



retention, can help improve the quality of whole wheat bread.

Various additives and enzymes as listed below can be

used in the production of whole wheat bread, to enhance the bread quality;

### 1. Vital Wheat Gluten:

Whole wheat flour leads to poor gluten structure development compared to white flour, which can affect the bread's structure and rise.

Adding vital wheat gluten helps improve the gluten formation and elasticity, resulting in a better-textured and volume bread.



### 2. Dough Conditioners:

Dough conditioners are additives that improve dough handling, machinability, and final bread quality. These include ascorbic acid (vitamin C), potassium bromate, enzymes, and or emulsifiers. These additives help strengthen the dough, improve gluten development leading to enhanced volume & crumb softness.

### 3. Enzymes:

Enzymes play a vital role in bread-making processes. Below enzymes are commonly used in bread production:

**Amylases:** These enzymes break down starch into simple sugars, providing

yeast with food for fermentation and improving dough fermentation and final volume.

**Proteases:** Proteases are enzymes that help break down proteins. In whole wheat bread, they can be used to improve dough extensibility, also contributing to a softer texture.

**Xylanases:** Xylanases break down the hemicellulose in whole wheat flour, helping to improve dough handling and volume. These can also enhance the shelf life of the bread by reducing staling.

**Glucose oxidases:** This enzyme acts like a replacement of gluten and supports in the strength and volume development of a bread.

**4. Emulsifiers:** Emulsifiers, such as DATEM (diacetyl tartaric acid esters of monoglycerides), SSL (Sodium stearoyl lactylate) help improve the texture and volume of bread. Monoglycerides helps in texture and crumb softness. These emulsifiers assist in creating a more stable dough structure and helps to retain moisture, resulting in a softer and more desirable texture.

## 6. FSSAI Labelling and Display Regulation:

There was no defined standards for whole wheat, brown and or speciality breads. However as per the Food Safety and Standards (Labelling and Display) Second Amendment Regulation, whole wheat bread shall have minimum 75% whole wheat flour, wheat or brown bread shall have minimum 50% whole wheat flour. And multigrain bread shall have minimum 20% grains apart from wheat. This regulation has come into force from 1st May 2023.

Most of the bakers due to above challenges, consumer preferences, fear of losses and regulatory mandates of such a high content of whole wheat and speciality ingredients, prefer to produce and sell more of white bread.

## Solutions to make a higher volume & softer Whole Wheat Bread:

To overcome these challenges, different techniques such as autolyse (resting the dough to hydrate the flour), pre-fermentation (fermenting a portion of the dough to improve flavour and texture), or adding vital wheat gluten to strengthen the gluten structure are followed.

Additionally, recipe adjustments, such as increasing hydration levels and incorporating ingredients like honey or molasses for moisture





It's important to note that the use of additives and enzymes in bread-making can vary depending on regional regulations, bakery practices, and product formulations. The specific additives and enzymes used may differ between manufacturers or even specific bread recipes.

A unique enzyme blend has been developed for such nutritious whole grain breads. This enzyme blend improves the dough handling characteristics, dough strength, oven spring and thus bread loaf volume. It gives softer and moister texture over shelf life.



Baker can make 100% whole wheat flour or atta bread and multigrain

breads using 20% multigrain as per the FSS (Labelling and Display) Second Amendment Regulation, using this solution.



### References:

1. <https://www.businesstoday.in/lifestyle/food/story/health-conscious-indians-spending-over-rs-800-a-month-on-good-bread-expert-366979-2023-01-21>
2. <https://sundayguardianlive.com/lifestyle/bread-now-staple-urban-indian-meals>
3. <https://www.verywellfit.com/whole-wheat-bread-nutrition-facts-and-health-benefits-5069803>
4. <https://www.nutritionfact.in/faqs/whole-wheat-flour-nutritional-value-per-100g>
5. <https://www.fatsecret.com/calories-nutrition/generic/flour-white?portionid=52099&portionamount=100.000>
6. <https://www.abreaducation.com/content/baking-bread-with-whole-wheat-flour>
7. <https://www.intechopen.com/chapters/41661>





# CARBOHYDRATE METABOLISM KINETICS FOR ENERGY UTILIZATION



**AUTHOR**  
**Dr Ramesh Prajapati,**  
 Manager Scientific Research, R&D  
 Zydus Wellnes



## Introduction

Carbohydrates, proteins, and fats are the three main macronutrients in food. Carbs provide immediate energy; proteins supply essential amino acids for muscle, skin, blood, and brain function, while fats contribute to brain development, insulation, energy reserves, and organ protection. All three provide energy (measured in calories): carbs and proteins provide 4 kcal/g, while fats provide 9 kcal/g. These nutrients vary in speed of energy supply, with carbs being the quickest and fats the slowest. The body utilizes these components for growth, maintenance, and activity.

Carbohydrates primarily supply energy to all cells in the body. Glucose is preferred by many

cells as an energy source over fatty acids. A balanced diet aims to provide sufficient carbs and fats to prevent protein from being used as an energy source. When glucose is insufficient, amino acids are



used to synthesize glucose, leading to protein breakdown, especially in muscle tissue. Adequate glucose spares protein breakdown by fulfilling

the body's glucose requirements. Carbohydrates serve as the body's primary fuel and the brain's preferred energy source. Converting

carbs to usable energy is easier than converting fat or protein. Sugars and starches provide glucose, the main energy source for the brain, central nervous system, and RBCs. Glucose can be stored as glycogen or converted to body fat. The Institute of Medicine (IOM) established a recommended daily allowance (RDA) of 130 g of carbs for adults and children aged ≥1 year, based on providing adequate glucose to the brain [1].

The IOM also set an acceptable macronutrient distribution range (AMDR) for carbs of 45-65% of total calories. Current dietary guidance emphasizes consuming carb-rich foods with fiber and nutrients. The World Health Organization (WHO) recommends limiting free sugar intake to no more than 10% of daily energy intake, excluding sugars in whole fruits and milk. Free sugar intake should be moderated based on age requirements (Table 1) [2].





# TRY NOW FOR INSTANT ENERGY<sup>^</sup> AND IMMUNITY<sup>#</sup>



Glucose Based Beverage Mix (14.1.4.3) (Proprietary Food).

<sup>^</sup>Creative visualization. Glucon-D does not contain any fruits. Fruits are for creative depiction. <sup>^</sup>Contains Glucose. Glucose is an instant source of energy. <sup>#</sup>Vitamin C helps support immunity. Glucon-D flavour variants are a rich source of Vitamin C. It contributes to min. 30% of Adult RDA of Vitamin C per serve, when prepared according to the label instruction. Vitamin D helps support immunity. <sup>†</sup>Glucon-D regular is a rich source of Vitamin D<sub>2</sub>. Per Serve Vitamin D<sub>2</sub> contribution: 26% of Adult RDA (ICMR-2010). Refer individual pack for more information. <sup>®</sup>Registered Trademark.



**Table 1: Calculated recommended intake from free sugars in relation to daily energy intake and expressed as teaspoons of sugar [2,3]**

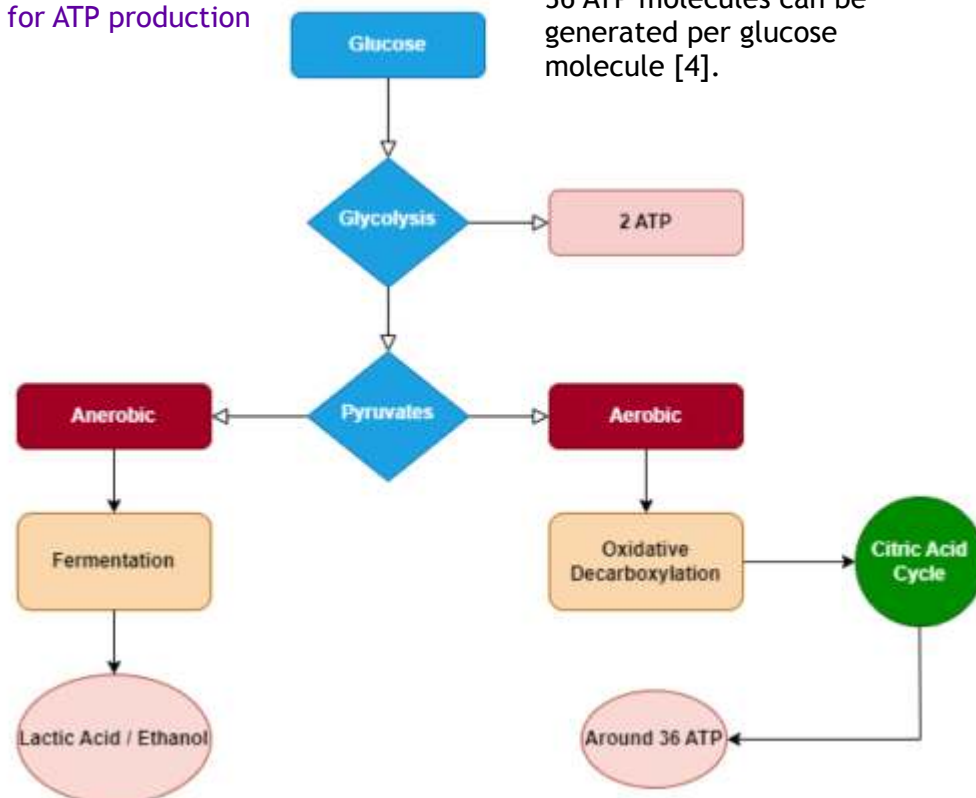
Age, y	Recommended energy intake at medium physical activity level, kcal/day		Free sugars (<5% of daily energy intake) (<g/day (<tea spoons/day))	
	Girls	Boys	Girls	Boys
2-<4	1.200	1.300	15 (3.5)	16 (4)
4 - <7	1.500	1.600	18 (4.5)	20 (5)
7 - <10	1.800	1.900	22 (5.5)	23 (5.5)
10 - <13	2.000	2.200	24 (6)	27 (6.5)
13 - <15	2.200	2.600	27 (6.5)	32 (8)
15 - <19	2.300	3.000	28 (7)	37 (9)

Sugar, such as glucose, is a natural carbohydrate found in various foods and serves as a vital energy source in organisms. It undergoes glycolysis to fuel cellular respiration, while excess carbohydrates are stored as glycogen or converted into fat. Glycogenolysis rapidly converts stored glycogen into energy. These glycogen reserves can provide a substantial amount of calories for nearly a day.

Carbohydrates can be categorized based on their size and structure. Mono- and disaccharides are simple carbohydrates consisting of one or two sugar units respectively. Oligosaccharides are formed by linking 2 to 20 monosaccharides, including well-known disaccharides like sucrose, lactose, and maltose. Polysaccharides, such as cellulose and starch, are complex carbohydrates composed of multiple monosaccharides connected by glycosidic bonds.

Complex carbs have a more gradual impact on blood sugar levels and contribute to digestive function and cholesterol regulation. Overall, sugars like glucose play a crucial role as a primary energy source, while carbohydrates with varying structures and sizes impact blood sugar levels and contribute to overall health.

**Figure 2: A summary of the main metabolic pathway for ATP production**



### Carbohydrates Metabolism

The process of digestion involves the breakdown of food into essential nutrient components. Within the digestive system, both mechanical and chemical processes convert starches and sugars into monosaccharides, which are then absorbed into the bloodstream for energy utilization. The initial breakdown of complex sugars into monosaccharides is initiated by salivary amylase, as depicted in Figure 1. Glucose, a type of sugar, undergoes further decomposition within cells, resulting in the release of stored energy, as illustrated in

Figure 2. Through aerobic respiration, approximately 36 ATP molecules can be generated per glucose molecule [4].



### Concept of Glycemic Index (GI) and Glycemic Load (GL)

The glycemic index (GI) is defined as a measure of the blood-glucose-raising ability of the available carbohydrate in foods. It is expressed as a percentage of the incremental area under the glycemic response curve (AUC) elicited by a portion of food containing 50g available carbohydrate in comparison with the AUC elicited by 50g glucose in the same subject [5]. The GI system classifies carbohydrate-containing foods based on their glycemic response, with a lower GI indicating slower carbohydrate absorption and a smaller rise in blood glucose levels. Figure 3 illustrates a typical blood glucose profile in response to different types of carbohydrates or carbohydrate-based beverages.

Chronic consumption of high glycemic diets have been linked with higher insulin levels and an elevated risk of developing diabetes. Glycemic Load (GL) considers both the glycemic index (GI) and the amount of carbohydrates in a serving. It provides a more accurate reflection of a food's impact on blood sugar levels. GL is calculated by multiplying the GI of a food by its carbohydrate content per serving, divided by 100.

### Carbohydrate Kinetics and Energy

The glycemic response can vary greatly depending on the type of carbohydrate. Simple carbohydrates like monosaccharide or disaccharides are easily absorbed in the body, while

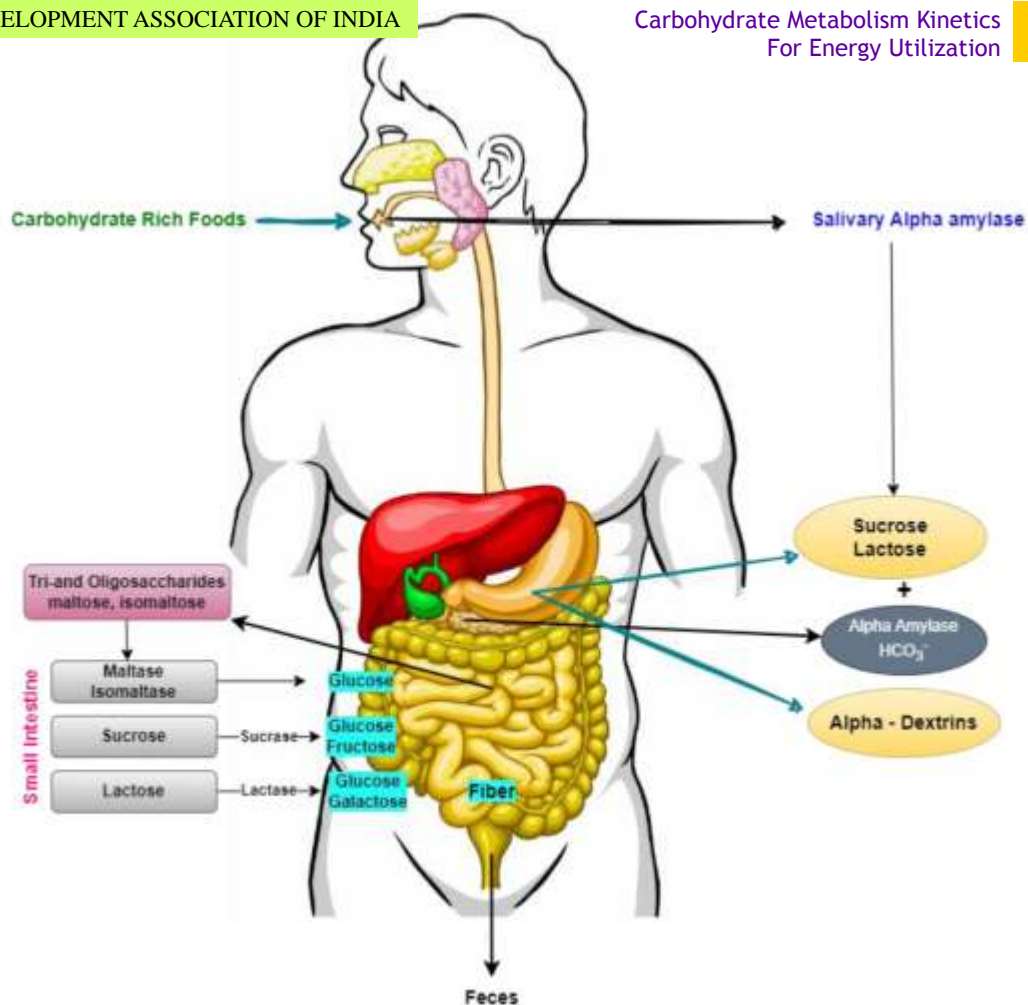


Figure 1: Metabolism pathways of carbohydrates at different stages in the body.

complex carbohydrates is converted first into monosaccharide form and then it gets absorbed in the blood causing delay in providing energy.

Glucose is the simplest form of sugar that is instantaneously absorbed into the blood and available for body to utilize it for energy; hence, glucose gives instant energy. The sharp rise in blood sugar levels when glucose (also known as dextrose) and maltodextrin consumed is evident in Figure 3.

Sucrose's delayed glycemic response is due to enzymatic breakdown in the small intestine, yielding

glucose and fructose. Glucose is rapidly absorbed and used for energy, while fructose undergoes liver metabolism, causing a slower glucose release, thus delaying the glycemic response. The slower digestion and absorption of Isomaltulose (a disaccharide of glucose and fructose) observed in Figure 4 compared to other carbohydrates is due to a more rigid bond ( -1,6-glycosidic bond) which is less readily hydrolyzed has unique effects on our body.



Glycemic Response of different Sugars

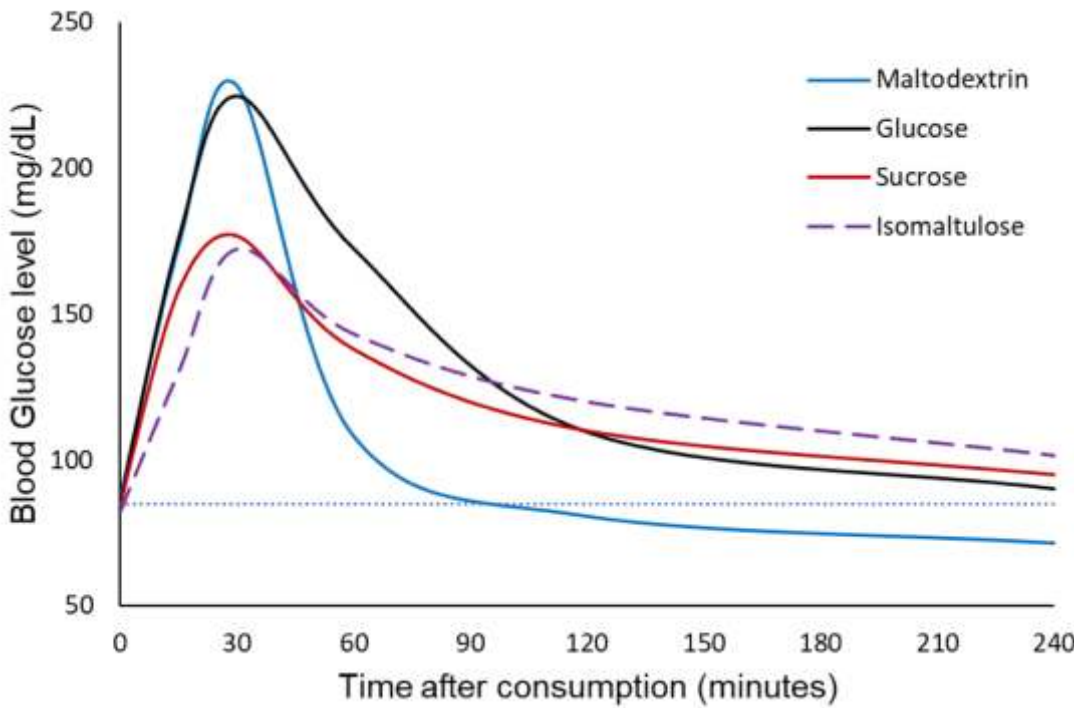


Figure 3: A representative diagram of the glycemic response of sucrose, glucose, maltodextrin and isomaltulose at equal concentration

The slower and lower rise in blood sugar in isomaltulose, combined with the absence of a hypoglycemic fall, provides a more controlled supply of glucose, and thus energy, to the muscles (and the brain) providing sustained energy.

Need for Instant and Sustained Energy

Sports and energy drinks, containing carbohydrates like glucose, are popular choices, especially among children,

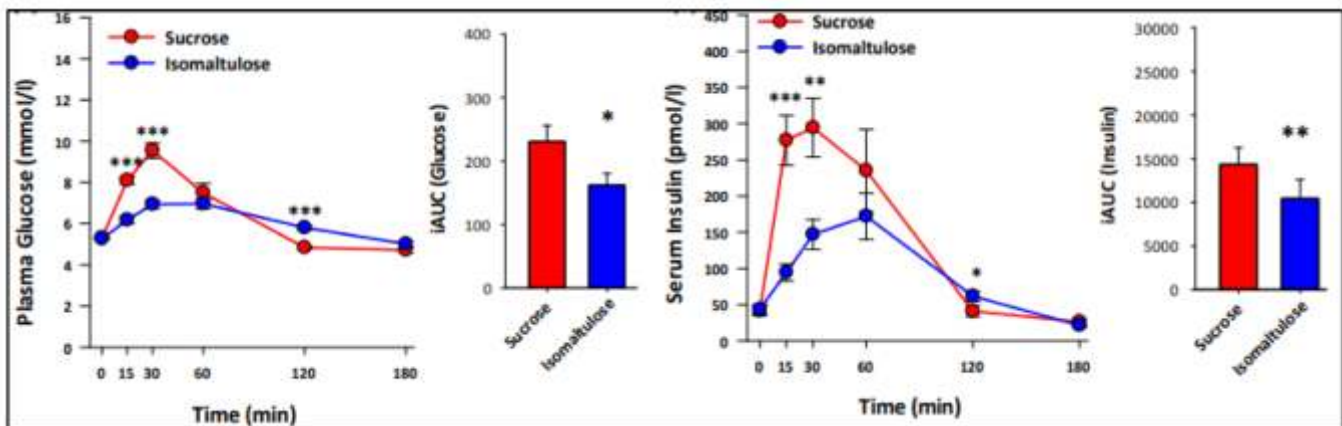
teenagers, and young adults. These beverages have been shown to enhance athletic performance, increase energy levels, and improve alertness. Glucose, a key component of these drinks, is transported to cells and tissues, where it undergoes metabolic reactions to release energy in the form of ATP. ATP fuels the body's energy-consuming processes. Glucose has also been found to have positive effects on reaction time, memory, and

concentration, particularly during more challenging tasks. Studies have shown that children who consumed glucose-based drinks performed better in memory tasks and exhibited improved focus compared to those who consumed a placebo [7].

Hot weather or prolonged exposure to high temperatures can lead to hypoglycemia, causing fatigue, lack of concentration, and hunger. This can result from factors like inadequate food intake, extended physical activity without proper nutrition, certain medical conditions, or excessive alcohol

consumption. Mild hypoglycemia can be managed by consuming 15g of fast-acting carbohydrates, such as glucose, and repeating the treatment if symptoms persist after 15 minutes (the "rule of 15") [8]. Glucose-based beverages replenish nutrients, quench thirst, and provide energy, while sports drinks with dextrose/glucose or glucose/sucrose blend are recommended for exercise and quick energy.

Figure 4: Significant difference in iAUC in plasma glucose and Insulin levels [6].







RELISH SUPER CREAMY OATS



LONG LASTING ENERGY



GRAINS SO SOFT, THEY BLEND EASILY IN YOUR RECIPES





In hot summers with increased outdoor activity, energy requirements rise, impacting nutrition and fitness. Sports beverages maintain endurance, prevent dehydration, sustain blood glucose, and replenish electrolytes during exercise.

According to the European Food Safety Authority (EFSA), a carbohydrate based hydrating beverage should contain 80-350 kcal/l from carbohydrates, and more than 75% of the energy should be derived from carbohydrates that induce a high glycaemic response, such as glucose, glucose polymers (e.g. maltodextrin), and sucrose.

The electrolyte used should contain between 20 mmol/l (460 mg/l) and 50 mmol/l (1150 mg/l) of sodium; having osmolality between 200 and 330 mOsm/kg water [9]. Beverages with an osmolality  $300 \pm 10\%$  mOsm/kg water may be named “isotonic” because their concentration of osmotic active substances per unit of mass is the same as in human plasma. Isotonic or slightly hypo-tonic solutions are thought to enhance water absorption during exercise [9].

A recent study [10] found that blood glucose levels started increasing as early as 60 seconds after consuming glucose, compared to other test solutions. Glucose also resulted in a higher and faster

peak blood glucose level within 30 minutes, compared to sucrose and glucose-sucrose blends in SD rats.

On the other hand, sucrose and formulations with a higher sucrose content showed a gradual decrease in blood glucose levels, providing usable energy for up to 4 hours. Drinks high in mono- and disaccharides have been shown to improve memory, cognition, energy levels, and physical performance in both children and adults.

Monosaccharides like glucose are rapidly absorbed into the bloodstream, providing **instant energy**. Disaccharides and higher oligosaccharides, which are broken down into monosaccharides like glucose before absorption, sustain blood glucose levels for a longer period, resulting in a steady release of energy over an extended duration. By utilizing the breakdown of disaccharides or oligosaccharides into simple carbohydrates, products and drinks can be developed to provide **sustained energy**. For example, energy bars or sports drinks that contain a complex carbohydrate derived from the breakdown of starch, can offer a gradual release of glucose for prolonged energy during physical activities. Similarly, products containing hydrolyzed sucrose or fructose, which

are broken down into glucose and fructose, can provide sustained energy for endurance events or long-duration activities.

### Conclusion

Energy drinks provide quick energy due to the added sugars they contain. Glucose is the primary form of sugar in these drinks and supports physical activity, cognitive function, and metabolism. However, it's important to be mindful of sugar intake. The American Heart Association recommends limiting daily added sugar to 25 grams (6 teaspoons) for women and 36 grams (9 teaspoons) for men, including sugars from beverages like energy drinks.

Sports or energy drinks can be consumed before, during, and after exercise to replenish energy and electrolytes. Glucose is the brain's main energy source, essential for focus and alertness. Glucose is quickly absorbed and used as an energy source, especially during hypoglycemia.





Strenuous physical activity can cause dehydration, and energy drinks with a combination of simple and complex carbohydrates (like glucose and sucrose) and electrolytes can provide immediate and sustained energy.

**References**

1. Institute of Medicine, Food and Nutrition Board. Dietary Reference Intakes: energy, carbohydrates, fiber, fat, fatty acids, cholesterol, protein, and amino acids. Washington: National Academies Press; 2002.

2. Fidler Mis, Nataša, et al. "Sugar in infants, children and adolescents: a position paper of the European society for paediatric gastroenterology, hepatology and nutrition committee on nutrition." Journal of pediatric gastroenterology and nutrition 65.6 (2017): 681-696.

3. World Health Organization. Guideline: sugars intake for adults and children. World

Health Organization, 2015.

4. Reichle, D. E. (2020). Energy processing by animals. The Global Carbon Cycle and Climate Change, 55-78.. Elsevier.

5. Henry, C.J.K. and Thondre, P.S., (2011). The glycaemic index: concept, recent developments and its impact on diabetes and obesity. *Smith Gordon*, 15(2), pp.154-175.

6. Pfeiffer, A. F., & Keyhani-Nejad, F. (2018). High glycemic index metabolic damage-a pivotal role of GIP and GLP-1. *Trends in Endocrinology & Metabolism*, 29(5), 289-299.

7. Beton, David, and Megan K. Stevens. "The influence of a glucose containing drink on the behavior of children in school." *Biological Psychology* 78.3 (2008): 242-245.

8. Evert, A. B. (2014). Treatment of mild hypoglycemia. *Diabetes Spectrum*, 27(1), 58-62.

9. European Food Safety Authority (EFSA). Scientific

opinion on the substantiation of health claims related to carbohydrate-electrolyte solutions and reduction in rated perceived exertion/effort during exercise (ID 460, 466, 467, 468), enhancement of water absorption during exercise (ID 314, 315, 316, 317, 319, 322, 325, 332, 408, 465, 473, 1168, 1574, 1593, 1618, 4302, 4309), and maintenance of endurance performance (ID 466, 469) pursuant to Article 13(1) of Regulation (EC) No 1924/2006 European Food Safety Authority. *EFSA Journal* 2011; 9(6): 2211.

10. Prajapati R, Mahapatra J, Sharma M, Jha A, Patro R, Dhar S, et al. (2023) Absorption Kinetics of Monosaccharides, Disaccharides and its Combination with its Impact on Glucose Availability. *Glob J Biol Agric Health Sci*. 12:172.





# INCLUSIVE LABELLING (BRAILLE):

## A POSSIBLE SOLUTION TO HIGH IMPACT SOCIAL PROBLEM IN INDIA



AUTHOR

**Mr Zafar Khan,**  
 Head- South East Asia Scientific  
 and Regulatory Affairs,  
 Mondelez International AMEA  
 Pte Ltd, SINGAPORE  
[zafar.khan@mdlz.com](mailto:zafar.khan@mdlz.com)

upcoming problem needs to be given a proper attention for a significant size of population moving towards dependency. Possible simple solutions like exploring Braille labelling on products like packed foods, food menus, and medical & health supplements packaging to enable easy access to basic products in giving independence to Blind & Visually impaired people.

### Direction of policy for disabled population:

India's national policy calls for social inclusiveness & better quality of life, the National Policy recognizes that Persons with Disabilities are valuable human resource for the country and seeks to create an environment that provides them equal opportunities, protection of their rights and

### An upcoming high impact social problem:

Visual impairment is a global issue, leading to various difficulties and significantly affecting ones' quality of life. While there are 285 million people with visual impairment worldwide, 90% live in developing countries (Shetty et al., 2021). A Blind or visually impaired person typically faces countless challenges

throughout their daily activities (Almukainzi et al., 2020). The risk of vision loss increases exponentially with age due to chronic eye diseases and aging processes (Wong et al., 2020). This is of concern as the proportion of the elderly is expected to increase from 617 million (8.5% of the world's population) to nearly 1.6 billion (17%) by the year 2050 (Wong et al., 2020). People who live in the developing world are five to ten times more likely to go blind than people who live in highly industrialized countries ("World Sight Day," n.d.2002).

India currently has around 12 million blind people which makes India home to one third of the world's blind population (Tosi et al., 2020). This





# 8 IMMUNITY NUTRIENTS BANAYE RAKHE IMMUNITY HAR DIN



Bournvita has nutrients that support your child's immunity. So, when schools re-open, they're ready to get going.

- Vitamin A
- Vitamin B12
- Vitamin C
- Zinc
- Vitamin D
- Selenium
- Iron
- Copper

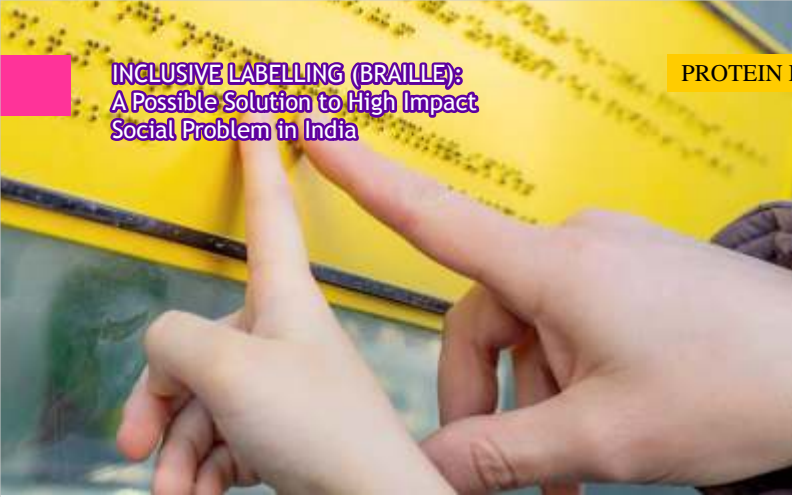


Bournvita encourages everyone to wear masks and practice social distancing while stepping out.

A bundle with Nutrients known to support in the maintenance of strong bones (Vitamin D, Phosphorus), strong muscles (Protein, Vitamin D), active brain (Iodine, Iron, Vitamin B2, Vitamin B12) and normal function of the immune system (Vitamins (A, B12, C, D), Zinc, Iron, Copper, Selenium). Recommended as part of a balanced diet and healthy lifestyle. 14.4g in Rs. 5/- pack (recommended serve of 3 packs a day).



**INCLUSIVE LABELLING (BRAILLE):  
A Possible Solution to High Impact  
Social Problem in India**



full participation in society (“Govt of India, Act 2016,” n.d.). Among authorities, Indian drug authority has been reviewing the proposal on Braille labelling (Minutes DCC agenda, CDSCO 14 Jul, 2020) and after thorough deliberation, DCC recommended for constituting a sub-committee to examine the issue in detail for its further consideration.



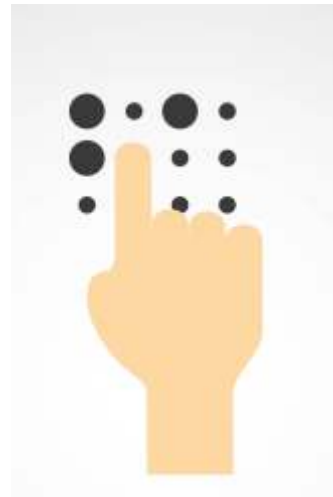
Different governments in the world have even made the use of Braille on medical packaging mandatory to better satisfy the requirements of the visually impaired in their countries (“Usage of Braille Packaging,” 2017). There is also a need for increasing awareness for Braille education.

**Feasibility of Braille as effective tool of labelling:** Study by (Marshall and Moys, 2020) suggests that providing people with visual impairments with access to a range of resources could support more

inclusive practices. The findings also suggest that in some contexts, such as information presented in public spaces and on packaging,

greater standardization of Braille could be of benefit to people with visual impairments.

Another study (Kostyra et al., 2017) revealed that majority of the visually impaired make food purchases at a supermarket or local grocery and they tend to favour shopping for food via the Internet.



The most frequently mentioned factors that facilitated their food shopping decisions were the assistance of salespersons, product labelling in Braille, scanners that enable the reading of labels and a permanent place for products on the shop shelves.

Many companies in the world have understood the need of inclusiveness for visually disabled people and have adapted Braille labelling on packs. Today’s early preparation will reduce the burden of tomorrow’s social problem.

**Triggers for Industry for adaptation of Braille labelling:**

In India, there is a need of convincing inputs from impacted population and conducive policy enablers for Industry to adapt Braille labelling on packs, which is simple and effective way of improving the quality of life. This will help in attaining independence for Blind & visually impaired people with Braille literacy to live a dignified life.

For industry, it is a very cost and effort intensive work hence a participative approach needs to be envisioned which attracts Industry investment with positive policy measures laid down as a roadmap for future in gradually creating a solution for visually disabled section of society to bring them in the mainstream.





References:

- Almukainzi, M., Almuhareb, A., Aldwisan, F., Alquaydhib, W., 2020. Medication use patterns in the visually impaired in Saudi Arabia and the importance of applying Braille labeling. Saudi Pharm. J. 28, 274-280.

- Govt of India, Act 2016 [WWW Document], n.d. URL <https://disabilityaffairs.gov.in/content/page/acts.php> (accessed 2.20.22).



- Kostyra, E., Zakowska-Biemans, S., Sniegocka, K., Piotrowska, A., 2017. Food shopping, sensory determinants of food choice and meal preparation by visually impaired people.



Obstacles and expectations in daily food experiences. Appetite 113, 14-22.

- Marshall, L., Moys, J.-L., 2020. Readers' experiences of Braille in an evolving technological world. Visible Lang. 54.

- Shetty, S., Sunita, S., Shetty, I., 2021. Empowering the visually impaired by customized Braille prescription and thus reducing medication errors. Indian J. Ophthalmol. 69, 1388.

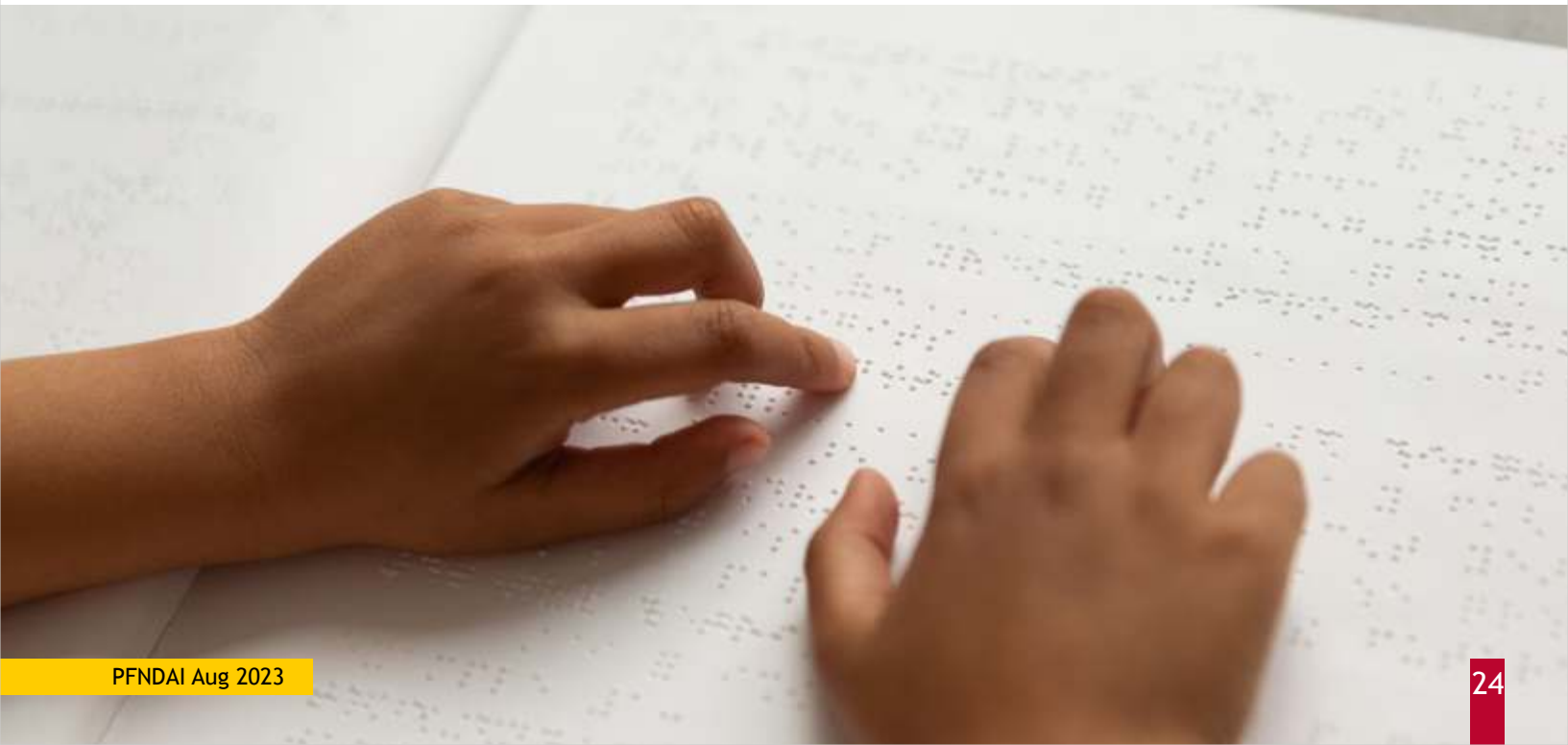
- Tosi, F., Iacono, E., Brischetto, A., Serra, A., Mani Teja Lingala, Mrudul Chilmulwar, 2020. Design for

Inclusion, Gamification and Learning Experience. Des. Incl. Gamification Learn. Exp. 116.

- Usage of Braille Packaging, 2017. URL <https://spointia.org/usage-of-braille-in-packaging-industry/> (accessed 2.20.22).

- Wong, Y., Xu, Y., Kang, L., Yap, K.Y.-L., 2020. Development of a 3D-printed Medication Label for the Blind and Visually Impaired. Int. J. Bioprinting 6.

- World Sight Day [WWW Document], n.d. URL <https://www.who.int/news/item/10-10-2002-world-sight-day-10-october> (accessed 2.20.22).





# FRUCTO-OLIGOSACCHARIDES: MYTHS AND FACTS



Dr Priyali Shah,

Lead Scientist,  
Tata Chemicals  
Innovation Centre

AUTHORS

&



Dr Shashank  
Bhalkar,

Assistant Director,  
PFNDAI

## Myth #1: Fructo-oligosaccharides are not healthy

**Fact:** Fructo-oligosaccharides have been classified as prebiotic fibres as substrates that are selectively utilized by host microorganisms conferring a health benefit<sup>1</sup>. Fructo-oligosaccharides have been

classified as dietary fibre by various jurisdictions and dietary fibres have been associated with benefits as improvement in bowel movements<sup>2</sup>. Some studies have shown that intake of fructo-oligosaccharides a) has laxative effects in constipated elderly subjects<sup>3</sup> and children<sup>4</sup>, b) helps to stimulate the

growth of colonic *bifidobacteria* in healthy subjects<sup>5,6,7</sup>, and c) to increase calcium absorption in healthy adolescent boys<sup>8</sup> and magnesium absorption in adolescent girls with a low calcium intake<sup>9</sup>.

## Myth #2: Fructo-oligosaccharides are Chemicals and are not natural.

**Fact:** Fructo-oligosaccharides are compounds that are integral part of commonly consumed foods and are naturally present in foods (fruits and vegetables) e.g. in artichoke, chicory, leek, garlic, asparagus, sugar beet, onion, banana, sugarcane, wheat, soybean, rye, barley, mustard, tomato, yacon, as well as bamboo shoots<sup>10</sup>. Commercially, these molecules as ingredients can also be produced from natural feedstock as sucrose/cane sugar or beet root or chicory through a natural bio-fermentation process.



# SEEKING A HEALTHIER ALTERNATIVE TO SUGAR?

Find the Perfect Solution in

# FOSSENCE®

Short chain Fructo-oligosaccharides



30%-70%  
sweetening  
power vs  
sucrose

Clean  
Sweet  
Taste

Similar  
rheological  
properties  
to sugar



## Applications



Bakery



Cereals



Desserts



Dairy



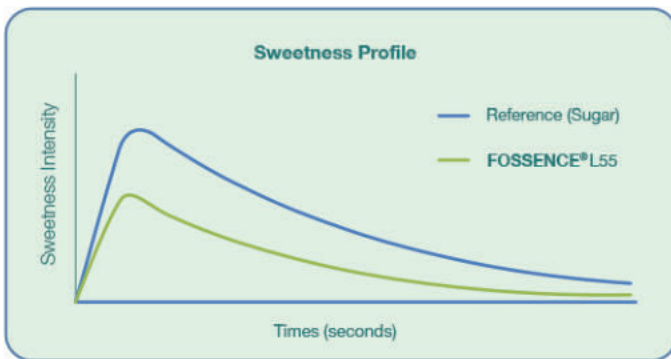
Confectionery



Nutraceuticals



Snacks



Indicative image of temporal profile of FOSSENCE® L55 compared to sugar



PREBIOTICS



For more details, write to us.

Contact us:

 [nutra@TataChemicals.com](mailto:nutra@TataChemicals.com)

 [www.TataNQ.com](http://www.TataNQ.com)

 <https://www.linkedin.com/company/tata-nq/>

SCAN FOR  
**FREE  
SAMPLES**

<https://www.tatanq.com/free-samples>





### Myth#3: Fructo-oligosaccharides are not safe.

**Fact:** Fructo-oligosaccharides are an approved ingredient and additive across geographies for food and beverage applications. Food Safety and Standard Authority of India (FSSAI) includes Fructo-oligosaccharides in the list of prebiotic compounds. Similarly, fructo-oligosaccharides have been General Recognized As Safe (GRAS) notified in the United States, and an approved food and beverage ingredient (also in infant foods) as per European Food Safety Authority (EFSA), and Health Canada, among other global jurisdictions.

### Myth#4: Fructo-oligosaccharides are not well tolerated.

**Fact:** Fructo-oligosaccharides, a prebiotic fibre, are fermentable fibres and tend to produce flatulence that may cause intolerance. The limits of prebiotic fibre intake per day have been regulated at not more than 40g/2000 kcal (for adults)<sup>11</sup>.

Fructo-oligosaccharides have specified their Tolerable Upper Limits as 20g per day. Combinations of fructo-oligosaccharides with other prebiotic fibres as inulin have shown to reduce the

intolerance such as gas production<sup>12</sup>.

It is important to note that every individual has varied fibre tolerability. And hence, individuals intolerant to fiber or advised fiber restriction by their health care professionals should read labels and consume the foods containing fructo-oligosaccharides accordingly.

### Myth #5: Fructo-oligosaccharides have no functional benefits

**Fact:** Fructo-oligosaccharides are functionally beneficial in various food and beverage applications. Fructo-oligosaccharides have a clean sweet taste, 30 - 40% that of sucrose. These are water soluble ingredients and thus a great fit for several food/beverage applications.

Fructo-oligosaccharides lead to various other functional benefits such as improved mouth feel, good humectancy, good binding agent, and taste enhancer. Inclusion of fructo-oligosaccharides in bakery makes it softer for longer. Also, it helps to enhance the flavour and masks off notes of

the food preparation.

### Myth #6: Fructo-oligosaccharides are disintegrated in the gastric acidic (low pH) condition (stomach), and do not reach intestines.

**Fact:** Fructo-oligosaccharides reach the large intestine intact. These molecules consist of fructose units linked by  $\beta$  2-1 bonds that are not susceptible to the action of gastrointestinal tract enzymes such as salivary, pancreatin and intestinal enzymes<sup>13</sup>. They resist the acidity of the gastric juice, and reach the large intestine intact, where they are selectively fermented by

the intestinal microflora, stimulating the growth or activity of health-related bacteria, mainly *Bifidobacterium* and *Lactobacillus*<sup>14</sup>. This has been

substantiated by numerous double blind clinical studies, showing increase in beneficial bacteria's relative abundance in the large intestine, as a result of consumption of fructo-oligosaccharides.

### Myth #7: Fructo-oligosaccharides have no nutritive value

**Fact:** Fructo-oligosaccharides are a family of Inulin Type Fructans (ITF) and have been included in the list of dietary fibre<sup>15</sup>. It is known that dietary fibres are complex carbohydrates and provide a lower energy level (2 kcal/g)





as compared to simple carbohydrates (4 kcal/g) as also recommended by the Indian Council of Medical Research, National Institute of Nutrition<sup>15</sup>.

### Myth #8: No need to take dietary fibre; Indian dietary patterns are fibre rich

**Fact:** Daily dietary fibre intake is an essential part of a balanced meal. It is recommended that the daily intake for dietary fibre should be 40g per 2000 kcal of energy consumed<sup>17</sup>.

Dietary fibre intake in India varies among different socioeconomic groups from 15 to 41 g/day, depending upon the type of food consumed<sup>18</sup>. Natural food sources for dietary fibre in Indian diet are lentils, banana, whole grains, barley, nuts, cucumber, moringa leaves, etc. Consumers should have a regular intake of whole foods that are naturally rich in dietary fiber. However, in recent times, processed foods consumption has increased which may limit the dietary fibre intake. Thus, inclusion of dietary fibre in packaged foods and formulations becomes pertinent to meet the daily dietary fibre requirements.

### Myth #9: Fructo-oligosaccharide is sweet to taste and will act as sugar, thus increasing blood sugar levels

**Fact:** Fructo-oligosaccharide is sweet to taste with a relative sweetness of approximately 30-40% to that

of sucrose<sup>19</sup>. However, they are resistant to hydrolysis by human digestive enzymes, escape digestion in the small intestine and enter the colon, ready to be metabolized by the resident gut bacteria. Being unavailable carbohydrates, they do not raise blood glucose when consumed within the tolerable limits. In fact, replacement of 30% available carbohydrates with fructo-oligosaccharides has shown to negate the spike of blood glucose level, which would have otherwise happened<sup>20</sup>.

### Myth#10: Fructo-oligosaccharide intake leads to major gastric disturbances

**Fact:** Fructo-oligosaccharides (also others as inulin, polydextrose, isomaltoligosaccharides, etc) are fermentable fibres, and mild production of gas is natural. These are metabolized by the gut bacteria that lead to metabolite production (as short chain fatty acids, lactic acids) as well as gases. Excessive intake/intake beyond tolerable limits of fermentable fibres may cause flatulence, leading to gastric disturbances. Further, it is important to note that the gastric disturbances vary between individuals depending on their tolerance to



fibre intake. It is recommended that individuals carefully read the labels of any food product and follow the recommended dosage/allowance limit for the products as mentioned.

#### References:

- 1 Gibson et al., Expert consensus document: The International Scientific Association for Probiotics and Prebiotics (ISAPP) consensus statement on the definition and scope of prebiotics. *Nat Rev Gastroenterol Hepatol*. 2017 Aug;14(8):491-502. doi: 10.1038/nrgastro.2017.75.
- 2 European Food Safety Authority, Scientific Opinion on Dietary Reference Values for carbohydrates and dietary fibre (2010), EFSA Panel on Dietetic Products, Nutrition, and Allergies. *EFSA Journal* 2010; 8(3):1462
- 3 Meksawan et al., Effects of Fructo-Oligosaccharide Supplementation on Constipation in Elderly Continuous Ambulatory Peritoneal Dialysis Patients. *Peritoneal Dialysis International*. 2016;36(1):60-66. doi:10.3747/pdi.2014.00015



4 Gordon et al., Cochrane Review: osmotic and stimulant laxatives for the management of childhood constipation (Review). *Evid. Base Child Health*, 2013; 8 (1), 57-109.

5 Tandon et al., A prospective randomized, double-blind, placebo-controlled, dose-response relationship study to investigate efficacy of fructo-oligosaccharides (FOS) on human gut microflora. *Sci Rep*. 2019; 9:5473. doi: 10.1038/s41598-019-41837-3

6 Bouhnik et al., The capacity of short-chain fructo-oligosaccharides to stimulate faecal bifidobacteria: a dose response relationship study in healthy humans. *Nutr. J.* 2006; 5 (1), 8, 28.

7 Bouhnik, et al., The capacity of nondigestible carbohydrates to stimulate fecal bifidobacteria in healthy humans: a double-blind, randomized, placebo-controlled, parallel-group, dose-response relation study. *Am J Clin Nutr*, 2004; 80 (6): 1658-1664.

8 van den Heuvel et al., Oligofructose stimulates calcium absorption in adolescents. *Am. J. Clin. Nutr.* 1999; 69 (3), 544-548.

9 van den Heuvel et al., Short-chain fructo-oligosaccharides improve magnesium absorption in adolescent girls with a low calcium intake. *Nutr. Res.*

2009; 29 (4), 229-237.

10 Borneo FR et al., Nutritional aspects of short-chain fructo-oligosaccharides: natural occurrence, chemistry, physiology and health implications. *Dig Liver Dis.* 2002 Sep;34Suppl 2:S111-20. doi: 10.1016/s1590-8658(02)80177-3.

11 Source:

[https://www.fssai.gov.in/upload/uploadfiles/files/Compendium\\_Nutra\\_29\\_09\\_2021.pdf](https://www.fssai.gov.in/upload/uploadfiles/files/Compendium_Nutra_29_09_2021.pdf)

12 Ghodusi et al. In vitro study on gas generation and prebiotic effects of some carbohydrates and their mixtures. *Anaerobe* 13 ,2007, 193-199.

13 Gibson et al. Dietary modulation of the human colonic microbiota: Updating the concept of prebiotics. *Nutrition Research Reviews*, 2004; 17, 259-275. <https://doi.org/10.1079/NRR200479>.

14 de Figueiredo et al., Evaluation of Xylo-oligosaccharides and Fructo-oligosaccharides on Digestive Enzymes Hydrolysis and as a Nutrient for Different Probiotics and Salmonella Typhimurium. *LWT* 118 (2020/01/01/ 2020): 108761. <https://doi.org/https://doi.org/10.1016/j.lwt.2019.108761>.

15 Office of Nutrition and Food Labeling Center for Food Safety and Applied Nutrition Food and Drug Administration, U.S. Department of Health and Human Services. Review of the

Scientific Evidence on the Physiological Effects of Certain Non-Digestible Carbohydrates. June 2018.

16 Recommended Dietary Allowances and Estimated Average Requirements for Indians- 2020. A Report of the Expert Group Indian Council of Medical Research National Institute of Nutrition

17 ICMR-NIN, Nutrient Requirements for Indians. Recommended dietary allowances. A Report of the expert group, 2020, ICMR-NIN; p3 [https://www.im4change.org/upload/files/RDA\_short\_report%281%29.pdf]

18 Indian Dietetic Association Working Committee on Position Paper on Dietary Fibre. Position of the Indian Dietetic Association: Dietary Fibre and Health. December 2018, pp. 1-14. Available online: <http://idaindia.com/wp-content/uploads/2018/12/IDA-position-paper-fibre-24.12.18.pdf>

19 Borneo FRJ. Undigestible sugars in food products. *Am J Clin Nutr*, 1994. 59:763S-9S. doi: 10.1093/ajcn/59.3.763S

20 Shah P, et al. Acute glycemic and insulin response of Fossence™ alone, or when substituted or added to a carbohydrate challenge: A three-phase, acute, randomized, cross-over, double blind clinical trial. *Heliyon*. 2021 Apr 28;7(4):e06805. doi: 10.1016/j.heliyon.2021.e06805



# REGULATORY ROUND UP



**AUTHOR**  
**Dr Shashank Bhalkar,**  
 Asst Director, PFNDAI  
[assistantdirector@pfndai.org](mailto:assistantdirector@pfndai.org)

Dear Readers,  
 Following are  
 notifications  
 /orders after  
 last Round  
 Up.

There were many orders in the previous month regarding extending the deadlines for the implementation of many orders based on the request of FBOs.

[Revised fee and timeline for use of pre-printed packaging material.](#) This order is regarding use of pre-printed packing materials not in compliance with FSS (Labelling and Display) Regulation 2020. The order allows final one-time permission to FBOs up to 31.12.2023 on payment of applicable fees which is Rs. 30000/- plus GST for Central Licensee and Rs. 12000/- plus GST for a State Licensee.



[Shelf life of Fortified Rice and Fortified Rice Kernel.](#) It is noticed that manufacturers of Fortified Rice (FR) and

Fortified Rice Kernels (FRK) mention the date of expiry. Procurement of FR is much more than the

requirements for the schemes and it remains in bulk storage beyond one year. Also, FCI has informed that shelf-life study of FR and FRK is in process and may take more than two years. In order to avoid any ambiguity regarding shelf life of FR and FRK, notified Food laboratories have been advised by FSSAI not to mention shelf-life related information till further directions from Food authorities.

[Sending of Referral samples to National Food Laboratories under Public -Private - Partnership.](#) The order mentions three National Food Laboratories which are in Public Private partnership. If the sample is tested in of these laboratories, the appeal / referral shall not be sent to the same laboratory.



[Extension of time-period for compliance of provision of warning statement for 'Pan Masala'.](#) Earlier order of 22nd May 2023, wherein as per FSS (Labelling and Display) Regulations 2022 enforcement of the warning statement on "Pan Masala" must cover 50% of FOP was deferred for three months from 1st May 2023. This order further extends it by three months from 1st August 2023.



[Abeyance of enforcement of provision related to Labelling requirement for fermented milk products.](#) Earlier Gazette notification (dated 11.01.2023) was regarding specifying labelling requirements for standards of Fermented milk. This was about replacing name "Fermented Milk" with Dahi, Yoghurt if product complies with relevant provisions of the standard. This was to be enforced from 01.08.2023. Because many representations were received on this and same is being reviewed by authorities. Therefore, the enforcement is kept in abeyance till further order.



[Extension of time-period for the compliance of Recommended Dietary Allowance \(RDA\) 2020.](#) Order dated 2nd August 2021 specified that RDA 2020 shall come into force for compliance from 1st July 23. However, there were many representations from many industry organisations requesting extension of implementation date owing to challenges of reformulation and inventory of old packing materials. In view of this the implementation is extended by six months to 31 December 2023.

#### [Referral Food Laboratories](#)

[Notified by FSSAI under section 43\(2\) of FSS Act, 2006:](#) This order widens the scope of FSSAI notified Referral Food



Laboratories. Now Appellate/ Reference samples may be sent to any Referral Laboratory as per their valid NABL scope of testing regardless of the areas of their jurisdiction. Therefore, all stakeholders can send their Appellate/ Reference samples to any Referral Food Laboratory as per their valid NABL scope. A list of the laboratories is also given.

[Direction regarding enforcement of the Food Safety and Standards \(Advertising and](#)

#### [Claims\) Second Amendment Regulations, 2022](#) FSS

(Advertising and Claims) second amendment rules 2022, specifies that in case of trade mark, brand name or fancy name containing adjectives such as “natural” “fresh,” “pure” etc. a disclaimer “This is only Brand name or Trade mark or Fancy name and does represent its true nature should be mentioned prominently on FOP. This was to be implemented with immediate effect from 13.12.2022. Many representations were from stakeholders that this would require artwork changes and consumption of inventories of the existing stock of packing materials. To ensure sustainable practice of FBOs, this has been given extension of six months from the date of notification (27th February 23)



#### [Monitoring the sale of Fresh Fruits and Vegetables in the market](#)

This order is about controlling excess use of Pesticides during pre-marketing treatment of Fruit and Vegetables. All state and UTs authorities are directed to keep strict vigil on FBOs involved in manufacturing/ repacking minimally processed/ surface treated fresh fruit and vegetables. In addition, activities like surveillance/ enforcement are also directed to comply with FSS (Contaminants, Toxins and



Residues) Regulations 2011 for the fresh fruit and vegetables sold in respective jurisdictions. Awareness campaigns under Eat Right India may be conducted in fruit/ vegetable markets. This is good initiative by authorities to protect the consumers. However, the success of such initiatives depends on the effective implementation.

#### [Validity of FSSAI recognized Food Testing Laboratories](#)

This order gives the list of FSSAI recognised laboratories along with their NABL validity as on 14 July 2023. This is routinely published by FSSAI and FBOs may find it useful for the purpose of testing of their samples.



#### [Manual of Methods of Analysis- Beverages: Tea, Coffee & Chicory](#)

The order is about Manual of Methods of analysis of Beverages: Tea, coffee Chicory. The pdf document is quite useful and informative to those in beverage industry.

These methods can also be adopted by Academic Institutes.

#### [Manual of Methods of Analysis- Fish &](#)

[Fish Products.](#) This order is about Manual of Methods of analysis of Fish and Fish products. The pdf document is quite useful and informative to those in fish and fish products industry.





# RESEARCH IN HEALTH & NUTRITION

**Low-flavanol diet drives age-related memory loss, large study finds**  
Science Daily May 29, 2023

A large-scale study led by researchers at Columbia and Brigham and Women's Hospital/Harvard is the first to establish that a diet low in flavanols -- nutrients found in certain fruits and vegetables -- drives age-related memory loss.

The study found that flavanol intake among older adults tracks with scores on tests designed to detect memory loss due to normal aging and that replenishing these bioactive dietary components in mildly flavanol-deficient adults over age 60 improves performance on these tests.

"The improvement among study participants with low-flavanol diets was substantial and raises the possibility of using flavanol-rich diets or supplements to improve cognitive function in older adults," says Adam Brickman, PhD, professor of neuropsychology at Columbia University Vagelos College of Physicians and Surgeons and co-leader of the study.

In the new study, the Columbia team collaborated with researchers at Brigham and Women's Hospital studying the effects of flavanols and multivitamins in COSMOS (Cocoa Supplements and Multivitamin Outcomes Study). The current study, COSMOS-Web, was designed to test the impact of flavanols in a much larger group and explore whether flavanol deficiency drives cognitive aging in this area of the brain.

More than 3,500 healthy older adults were randomly assigned to receive a daily flavanol supplement (in pill form) or placebo pill for three years. The active supplement contained 500 mg of flavanols, including 80 mg epicatechins, an amount that adults are advised to get from food.

At the beginning of the study, all participants completed a survey that assessed the quality of their diet, including foods known to be high in flavanols. Participants then performed a series of web-based activities in their own homes, designed and validated by Brickman, to assess the types of short-term memory governed by the hippocampus.

The tests were repeated after years one, two, and three. Most of the participants identified themselves as non-Hispanic and white.

More than a third of the participants also supplied urine samples that allowed researchers to measure a biomarker for dietary flavanol levels, developed by co-study authors at Reading University in the UK, before and during the study. The biomarker gave the researchers a more precise way to determine if flavanol levels corresponded to performance on the cognitive tests and ensure that participants were sticking to their assigned regimen (compliance was high throughout the study).

Flavanol levels varied moderately, though no participants were severely flavanol-deficient.

**People with mild flavanol deficiency benefited from flavanol supplement**

Memory scores improved only slightly for the entire group taking the daily flavanol supplement, most of whom were already eating a healthy diet with plenty of flavanols.



But at the end of the first year of taking the flavanol supplement, participants who reported consuming a poorer diet and had lower baseline levels of flavanols saw their memory scores increase by an average of 10.5% compared to placebo and 16% compared to their memory at baseline. Annual cognitive testing showed the improvement observed at one year was sustained for at least two more years.

The results strongly suggest that flavanol deficiency is a driver of age-related memory loss, the researchers say, because flavanol consumption correlated with memory scores and flavanol supplements improved memory in flavanol-deficient adults.

## Eat right, live longer: Could a moderate protein diet be the coveted elixir of youth?

Science Daily May 31, 2023

Consuming nutritious food can improve metabolic health and delay aging. But what are the appropriate quantities of dietary macronutrients that can help achieve this?



To answer this, researchers from Japan fed isocaloric diets with varying amounts of protein to young and middle-aged male mice. They found that the mice were metabolically healthier when fed moderate-protein diets. These findings could provide valuable insights into developing nutritional interventions and improving metabolic health in people.

In a new study published in *GeroScience* on April 28, 2023, a team of researchers led by Assistant Professor Yoshitaka Kondo from Waseda University, Japan, investigated the amount of dietary protein needed to improve metabolic health in mice approaching old age.

They recruited young (6 months old) and middle-aged (16 months old) male C57BL/6NCr mice who were fed isocaloric diets with varying protein content (5 to 45 %) for two months. After two months, the effect of varying protein diets was assessed based on measurements of skeletal muscle weight, liver and plasma lipid profiles, and self-organizing map (SOM) cluster analysis of plasma amino acid profiles.

The team observed that the consumption of a low-protein diet led to the development of mild fatty liver, with increased levels of hepatic lipids in middle-aged mice as compared to young mice. In contrast, a moderate-protein diet led to reduced blood glucose concentrations and lipid levels in both liver and plasma.



These findings indicate that a moderate-protein diet (25% and 35%) kept both young and middle-aged mice metabolically healthier.

On examining the effect of varying protein diets on plasma amino acid concentrations in mice of both age groups, the researchers observed that the plasma concentration of individual amino acids varied with age and varying dietary protein content. This was further validated using SOM analysis of the plasma amino acids.

Furthermore, the plasma amino acid profiles revealed using SOM analysis showed the correlation between different protein intake and the varying amounts of hepatic triglycerides and cholesterol levels.

In conclusion, a balanced diet with moderate amounts of protein could be the key to a long and healthy life.







## Multivitamin improves memory in older adults, study finds

Science Daily May 24, 2023

Taking a daily multivitamin supplement can slow age-related memory decline, finds a large study led by researchers at Columbia University and Brigham and Women's Hospital/Harvard.



"Cognitive aging is a top health concern for older adults, and this study suggests that there may be a simple, inexpensive way to help older adults slow down memory decline," says study leader Adam M. Brickman, PhD, professor of neuropsychology at Columbia University Vagelos College of Physicians and Surgeons.

In the current study, more than 3,500 adults (mostly non-Hispanic white) over age 60 were randomly assigned to take a daily multivitamin supplement or placebo for three years. At the end of each year, participants performed a series of online cognitive assessments at home designed to test memory function of the hippocampus, an area of the brain that is affected by normal aging. The COSMOS-Web study is part of a large clinical trial led by Brigham &

Women's Hospital and Harvard called the COcoa Supplement and Multivitamin Outcomes Study (COSMOS).

By the end of the first year, memory improved for people taking a daily multivitamin, compared with those taking a placebo. The researchers estimate the improvement, which was sustained over the three-year study period, was equivalent to about three years of age-related memory decline. The effect was more pronounced in participants with underlying cardiovascular disease.

The results of the new study are consistent with another recent COSMOS study of more than 2,200 older adults that found that taking a daily multivitamin improved overall cognition, memory recall, and attention, effects that were also more pronounced in those with underlying cardiovascular disease. "There is evidence that people with cardiovascular disease may have lower micronutrient levels that multivitamins may correct, but we don't really know right now why the effect is stronger in this group," says Brickman.

## Good nutrition important for aging brain

"Our study shows that the aging brain may be more sensitive to nutrition than we realized, though it may not be so important to find out which specific nutrient helps slow age-related cognitive decline," says Lok-Kin Yeung, PhD, a



postdoctoral researcher in Columbia's Taub Institute for Research on Alzheimer's Disease and the Aging Brain and first author of the study.

"The finding that a daily multivitamin improved memory in two separate cognition studies in the COSMOS randomized trial is remarkable, suggesting that multivitamin supplementation holds promise as a safe, accessible, and affordable approach to protecting cognitive health in older adults," says co-author JoAnn Manson, MD, chief of the Division of Preventive Medicine at Brigham and Women's Hospital.

## Nitrate: Healthy heart or cancer risk? Meet nutrition's Jekyll and Hyde

Science Daily May 21, 2023

Despite our understanding of nutrition expanding remarkably in recent times, few aspects of our diet continue to confuse and divide the experts like nitrate. For a long time nitrate has been viewed warily, with previous research showing it could potentially be linked to causing cancer.





cardiovascular disease if it's sourced from vegetables. So the review looked to unpack all of that, identify new ways forward and ways that we can solve this puzzle, because it's really time to address it: it's been 50 years."

However, subsequent research has revealed dietary nitrate also has various cardiovascular health benefits, which could help reduce the risk of related conditions such as heart disease, dementia and diabetes. So, how can one dietary compound have such contrasting potential risks and benefits? Edith Cowan University's (ECU) Nutrition and Health Innovation

Research Institute hopes to find out how and why nitrate has such contrasting potential risks and benefits.



### All about the source

Dr Catherine Bondonno led a review of nitrate research and says the key may lie in where it comes from. "We get nitrate from three major dietary sources: meat, water and vegetables," she said. "Nitrate's reputation as a health threat stems from 1970, when two studies showed it can form N-nitrosamines, which are highly carcinogenic in laboratory animals.

However, no human studies have confirmed its potential dangers, and our clinical and observational studies support nitrate preventing

### Urgency required

Despite recent research indicating the source of nitrate may affect its health benefits and risks, current dietary guidelines relating to nitrate have been in place since the 1970s and don't differentiate between nitrate from meat, vegetables and water.

Dr Bondonno said while the 1970s animal studies reported a small incidence of malignant tumours, there was evidence not all nitrates deserve to be tarred with the same brush. "For instance, unlike meat and water-derived nitrate, nitrate-rich vegetables contain high levels of vitamin C and/or polyphenols that may inhibit formation of those harmful N-nitrosamines associated with cancer," she said.

Dr Bondonno said it was vital more research was conducted so guidelines could be updated. "The public are unlikely to listen to messages to increase intake of nitrate-rich vegetables, if they are

concerned about a link between nitrate intake and cancer. We need to be sure nitrate-rich vegetables don't actually have an increased risk of cancer if we consume a higher amount," she said. "High dosage nitrate supplements are already used to improve physical performance in sport, while vegetable nitrate extracts are being added to cured meat products with a "clean label" claim, purporting to be better for you. So we really need to get this right."

### A special omega-3 fatty acid lipid will change how we look at the developing and aging brain

Science Daily May 5, 2023

Scientists from Singapore have demonstrated the critical role played by a special transporter protein in regulating the brain cells that ensure nerves are protected by coverings called myelin sheaths.

The findings, reported by researchers at Duke-NUS Medical School and the National University of Singapore in the Journal of Clinical Investigation, could help to reduce the damaging impacts of ageing on the brain.







sclerosis and Alzheimer's disease," said Dr Sengottuvel Vetrivel, Senior Research Fellow with Duke-NUS' Cardiovascular & Metabolic Disorders (CVMD) Programme and lead investigator of the study. "Developing therapies to improve myelination -- the



## High salt intake could increase dementia and Alzheimer's Disease risk, study flags

30 May 2023 Nutrition Insight

As warnings against high salt consumption - especially of table salt - have been given by the World Health Organization (WHO), several non-governmental health-related organizations and numerous health-promoting entities, a new study shows that high salt-induced hypertension can also be correlated with emotional and cognitive impairment.

The WHO advises limiting salt intake to less than 5 g per day and the reasons for these often revolve around salt's effects on the cardiovascular system, obesity and non-communicable diseases. However, researchers in Japan have now concluded that high salt intake can also lead to an increase in a key biomarker associated with Alzheimer's disease and other biomarkers associated with the symptoms of dementia.



An insulating membrane encasing nerves, myelin sheaths facilitate the quick and effective conduction of electrical signals throughout the body's nervous system.

When the myelin sheath gets damaged, nerves may lose their ability to function and cause neurological disorders. With ageing, myelin sheaths may naturally start to degenerate, which is often why the elderly lose their physical and mental abilities.

"Loss of myelin sheaths occurs during the normal ageing process and in neurological diseases, such as multiple

sclerosis and Alzheimer's disease -- in ageing and disease is of great importance to ease any difficulties caused by declining myelination."

"Our study indicates that LPC omega-3 lipids act as factors within the brain to direct oligodendrocyte development, a process that is critical for brain myelination," explained Professor David Silver, the senior author of the study and Deputy Director of the CVMD Programme.

"This opens up potential avenues to develop therapies and dietary supplements based on LPC omega-3 lipids that might help retain myelin in the ageing brain -- and possibly to treat patients with neurological disorders stemming from reduced myelination."

Previously, Prof Silver and his lab discovered Mfsd2a and worked closely with other teams to determine the function of LPC lipids in the brain and other organs.

The current research provides further insights into the importance of lipid transport for oligodendrocyte precursor cell development.





water for 12 weeks and monitored their blood pressure during that time.

The brains of the mice were then analyzed and were found to have undergone biochemical alterations such as the

increase in phosphates attached to tau and a decrease in CaMKII - a key enzyme involved in signalling in the brain. Additionally, the levels of the protein PSD95 which aids in the functioning of brain synapses were also noted.

The researchers then looked for changes in angiotensin II (Ang II) and its receptor AT1 and the lipid molecule prostaglandin E2 (PGE2) and its receptor EP1. The hormone Ang II plays a vital role in fluid balance and the regulation of blood pressure, while PGE2 is associated with hypertension and neurotoxicity. The researchers used a mouse model to understand the

extent of salt's effects on the brain.

The results show that high salt consumption interplayed with all of these

factors. Salt-induced hypertension in conjunction with a "crosstalk" between Ang II-AT1 and PGE2-EP1 caused emotional and cognitive dysfunction while promoting the Alzheimer's-related tau protein biomarker.

"Excessive salt intake is considered a risk factor for hypertension, cognitive dysfunction, and dementia,"

says Dr. Hisayoshi Kubota, lead author of the study. "However, studies focusing on the interaction between the peripheral and central nervous system have not sufficiently investigated this association."

Edited by William Bradford Nichols

The study shows that excessive table salt intake can increase several biomarkers for dementia and Alzheimer's disease. "This study is of particular social and economic importance because the annual social cost of dementia treatment in Japan is surging like never before," Dr. Akihiro Mouri, a professor and researcher at Fujita Health University in Toyoake, Japan, and secondary author of the study. "Therefore, developing preventive and therapeutic drugs for dementia seems critical for Japan's rapidly aging population."

### Increased biomarkers

Though some studies have linked diets, such as the Mediterranean and DASH (dietary approaches to stop hypertension) diets, to lowering the Alzheimer's



disease-specific biomarker called the tau protein, this study seems to show that high salt consumption contributes to the phosphates that form tau tangles - clusters of tau proteins - in the brain.

The researchers used a mouse model and fed the mice a high salt solution consisting of 2% sodium chloride in drinking



### Toddlers' gut microbiota predicts obesity by the age of five, according to study

22 May 2023 Nutrition Insight

French scientists have found a link between toddlers' gut bacteria and a prediction of obesity by the age of five, predicted by Body Mass Index (BMI). The study evidences that the bacteria Firmicutes and Bacteroidetes are directly involved with obesity, as individuals with higher levels of Bacteroidetes were shown to be leaner.

Presented at the 30th European Congress on Obesity, the scientists also suggest that differences in bacteria in obese individuals might be explained by changes in the gut microbiota in early childhood.







“What surprised us the most is that differences in the gut microbiota composition observed in the adult obesity population are already observed in early childhood before the onset of overt obesity and all its associated metabolic complications,” Gaël Toubon, lead researcher of the study and a Ph.D. candidate at Inserm, Université Paris Cité and Université Sorbonne Paris Nord, France, tells NutritionInsight.

“The gut microbiota is emerging as an important early-life factor able to influence weight gain in childhood and later life. Our findings reveal how an imbalance in distinct bacterial groups may play an important role in the development of obesity,” he adds.

The researchers investigated changes in toddlers’ gut microbiome between two and five years old and included preterm infants. Stool samples were collected when the infants reached the age of 3.5 and a positive association between BMI and the ratio of Firmicutes to Bacteroidetes gut bacteria was measured.

“The reason these gut bacteria affect weight is because they regulate how much fat we absorb,” explains Toubon. “Children with a higher ratio

of Firmicutes to Bacteroidetes will absorb more calories and be more likely to gain weight.”

Furthermore, they found six specific bacteria that predicted BMI scores. A lower level of Eubacterium hallii group, Fusicatenuibacter and Eubacterium ventriosum group in the gut showed a higher risk to increase BMI. A higher level of Eggerthella, Colidextribacter and Ruminococcaceae CAG-352 showed lower BMI scores.

By Beatrice Wihlander



### “Landless” protein poised for development

19 May 2023 Nutrition Insight

ADM and Air Protein, a pioneer in air-based nutritional protein that requires no agriculture or farmland, are collaborating on R&D to advance new and novel proteins for nutrition.

The Strategic Development Agreement will combine ADM’s broad nutrition, formulation and research expertise with Air Protein’s unique landless agriculture platform to identify ways to scale cost-effective ingredients that enable meat substitutes to deliver on their cost, nutrition, flavour and texture targets. Speaking to

FoodIngredientsFirst, Ian Pinner, senior vice president for strategy and innovation at ADM, says food security, sustainability and health and well-being are the three trends driving structural changes in the global food system, particularly as the population continues to grow.

“Expanding the protein ecosystem, including choices from plant-based, animal-based and novel sources, will be needed to feed people worldwide while keeping what’s best for our planet in mind. Our expanded partnership with Air Protein represents one of the many ways we’re making important strides toward bringing new protein options to the marketplace, further expanding the future possibilities of protein development.”

### Scaling protein

Growing proteins depends on highly unpredictable factors, including weather, geography, politics, global agriculture supply chain costs, limited natural resources and manufacturing disruptions. Dr. Lisa Dyson, founder and CEO of Air Protein, tells us that its farms are self-contained systems requiring only air, water, and energy to grow our protein, creating virtually no disruptions and predictable costs.





“Air Protein Farms decouple protein production from the supply chain and can be built virtually anywhere, in any climate. Our process is carbon negative and can help achieve Scope 3 emission goals faster,” she says. Moreover, consumers are demanding better taste and textures in next-generation foods. Dyson believes that by applying a range of culinary techniques to Air Protein (e.g., cooking, cracking and fermenting), the company has produced a range of flavours, tastes, textures and nutritional attributes that allows us to craft meats and other protein-rich foods.

“What we are creating is a new way of making food that is both sustainable and nutritious using only air, water, and energy. Air Protein is rich in vitamins, minerals, and nutrients, contains 20 amino acids, including all nine essential amino acids and has twice the amino acids of soybeans.”

By Elizabeth Green

## Immunity-boosting postbiotic supports faster recovery of mild COVID-19 symptoms in clinical trial

18 May 2023 Nutrition Insight

Researchers found that a *Lactococcus lactis* strain of plasma could result in an early recovery of smell and taste dysfunction in COVID-19 patients and a reduction of the

viral load. The postbiotic was researched and developed by Kirin Holdings.

*L. lactis* strain plasma is a lactic acid bacteria that activates plasmacytoid dendritic cells (pDC), which play a crucial role in the immune system. The clinical trial determined that *L. lactis* strain plasma helped maintain the pDC blood levels decreased in COVID-19 patients, which were significantly reduced in the placebo group. “Kirin Holdings hopes that *L. lactis* strain plasma will become one of the new treatments or adjunctive care to patients with mild COVID-19,” Tatsuya Takada, corporate communications manager at Kirin Holdings, tells *NutritionInsight*. The *L. lactis* strain plasma helped patients recover smell and taste dysfunction early.

“Right now, with these kinds of research, we are exploring its potential as a pharmaceutical product. Although we are advancing research and development for drug development, we cannot provide details at this time. However, we will consider various possibilities.” “Although this research and development were for pharmaceutical products, we will license *L. lactis* strain plasma out to domestic and overseas companies in the

food field and expand ‘immune care’ to a wide range of consumers by launching more products.”



## Clinical trial

Nagasaki University in Japan conducted a double-blinded, randomized controlled trial on the efficacy and safety of the ingredient. During 14 days, one group consumed four capsules containing 400 billion *L. lactis* plasma in total against a placebo. “The efficacy against chemosensory disturbance, which has not been observed with antiviral drugs, was observed in this study,” notes Takada.

However, the researchers found no difference in the two groups for seven key symptoms of COVID-19, which was the primary focus of the trial: cough, shortness of breath, fatigue, headaches, anosmia and dysgeusia (losing sense of smell and taste), anorexia and chest pain.

“The number of subjects was small, 50 in each group and there was no observed difference in the primary endpoint,” comments Takada.

IMuse was the first branded ingredient to achieve the “Foods with functional claims for immune health” label on its products in Japan.

By Jolanda van Hal







## Macronutrients key to immune health for COVID-19 patients, flag experts

15 May 2023 Nutrition Insight

Dietary proteins, omega 3 fatty acids, protein and probiotics may strengthen the immune system against the virus causing COVID-19 by decreasing inflammation and oxidative stress, Iran-based researchers suggest.

Specifically, dietary proteins may boost lung function in patients with COVID-19. Diets high in protein and amino acids also facilitate antibody production, argue the scientists. They further note that omega 3 fatty acids could improve oxygenation, acidosis - reduced blood and body tissue alkalinity - and liver function. Moreover, probiotics have been shown to improve oxygen saturation significantly, which may enhance the survival rate in patients.

The study published in *Frontiers in Nutrition* reviews available research to determine the effectiveness of macronutrients and probiotics in improving immunity in patients with COVID-19. These macronutrients and microbiota are critical for general health and support the immune system's normal function.

## Protein for antibodies

According to the authors, data suggest diets that positively impact immune function contain adequate amounts of protein, especially glutamine, arginine and branched-chain amino acids. Diets high in protein and amino acids have been found to facilitate antibody production. The review highlights that sufficient protein intake is vital for antibody production, as proteins facilitate biochemical reactions and enzyme production. They act as cellular signals through hormones and cytokines, which are signalling proteins that help control inflammation and allow the immune system to mount a defence against substances that enter the body.

The COVID-19 virus uses the angiotensin-converting enzyme 2 (ACE2) to defeat the barrier and bind to host cells. This enzyme usually binds angiotensin II, a molecule that promotes inflammation, oxidative stress and apoptosis - cell self-destruction. By inhibiting ACE, dietary proteins may reduce this process and protect the barriers of lungs, kidneys, heart and intestines where ACE2 is expressed. The study highlights evidence that asymptomatic patients and those with mild COVID-19 symptoms treated with lactoferrin protein had faster clinical recovery than untreated patients.



## Probiotics' immune regulation

Studies have reported that microbiota improves resistance to viruses or pathogenic attacks of respiratory mucosa, according to the review. Probiotics' beneficial effects are likely the result of immune regulations and controlling pro- and anti-inflammatory cytokines. For example, clinical trials have shown that probiotics positively affect the gut and lungs by increasing regulatory T cells, improving antiviral defence and reducing pro-inflammatory cytokines during systemic and respiratory infections.

## Anti-inflammatory response with omega 3

The authors refer to a study that linked omega 3 fatty acids from marine food to lower COVID-19 mortality rates. They explain that omega 3 fatty acids help to prevent the virus from entering cells by altering the phospholipid bilayer of the cell membrane. Eicosapentaenoic acid from fish and seafood sources gets incorporated into the plasma membrane, resulting in fewer pro-inflammation signals. Moreover, omega 3 fatty acids are critical in mediating inflammatory processes and modulating immune responses.

By Jolanda van Hal



# FOOD SCIENCE & INDUSTRY NEWS

## “Essential nature of vitamins” holds health benefits, format and demographic opportunities, experts tout

30 May 2023 Nutrition Insight

Consumer interest in managing health and general well-being for disease prevention is increasing, creating opportunities to develop new vitamin supplements and product formats for a growing range of health benefits.

These should offer proven and convenient solutions, which results in challenges of stability and legislation for manufacturers.

*NutritionInsight* dives into opportunities and challenges in the vitamins market with professionals from Lycored, Bart, Gnosis by Lesaffre and PharmaLinea.

“The essential nature of vitamins means there is constantly new research and learnings in support of their effectiveness in supporting human wellness,” explains Christiane Lippert, global

product manager of Vitamins & Delivery Systems at Lycored. “The industry continues to focus on making them perform better in applications to better cater to consumers’ needs.”

The industry continues to make vitamins perform better in applications to cater to consumer needs. Vitamins have, in one way or another, always been a critical component in dietary supplements, adds Maja Orešnik, science & research director at PharmaLinea. “For example, vitamin C is used in dietary supplements for beauty, joints, cardiovascular health and sports. Vitamin D has recently been shown to play a large role in regulating blood glucose and developing diabetes. Vitamin K2 is mostly used for bone and cardiovascular health but can also be used for blood glucose balance. And lastly, B vitamins can be used for mood and pain support.”

### New health indications

Advancements in the vitamin market must begin with the essential clinical validation that confirms safe and

efficacious health benefits, cautions Philippe Caillat, global market manager at Gnosis by Lesaffre. For example, he shares scientific evidence on how vitamin K2’s cardiovascular mechanism plays a substantial role in its potential impact on other indications, such as brain health. The vitamin activates vitamin K-dependent proteins in the body to properly utilize calcium. “A more recent study revealed that higher concentrations of vitamin K2 were linked to reduced risk of developing dementia (17%) and mild cognitive impairment (20%).”

Caillat shares that there is also compelling evidence linking folate to other areas of health, such as mood, cognition and glucose management, plus its potential to enhance formulas when combined with synergistic nutrients.

Lippert from Lycored adds, “New scientific publications continually shed light on areas previously less documented, such as vitamin D alongside omega 3 and its impact on autoimmune conditions.”





Moreover, she notes research found “supplementation with vitamins C and E and beta-carotene modulates the diversity and abundance of the gut microbiome, maintains immune system function and improves intestinal barrier function.”

### Strategies for new product launches

Matevz Ambrozic, marketing and PR director at PharmaLinea, shares examples of increasingly popular added-value sources of vitamins, such as liposomal. “For example, in 2022, Olimp labs launched a product - Gold-vit-C+D3 - based on a liposomal vitamin C.”

Others include vitamins that are “microencapsulated, metabolite-enriched, in their active form, clinically studied and plant-based. In 2022, Ganestra launched emulsified vegetarian vitamin D3 drops.” Companies also use innovative delivery formats to stand out on the market, such as gummies and chewables, continues Ambrozic. “For example, Gatorade launched immune support gummies in 2022.” He highlights other product formats, including sprays - such as Natures Aid’s vitamin D3 sprays for children - orodispersible tablets, which dissolve in the mouth, syrups and drops. “One of the more notable innovations is the recent launch of a line extension of the Emergen-C brand by Haleon. In spring 2023, they introduced Emergen-C Crystals - direct sticks with powder that pop in your mouth.”

Brands also differentiate their

products with outcome-based positioning, says Ambrozic. “From products positioned purely as ‘vitamin X’ to products highlighting a specific functional benefit or outcome. Energy is on the rise and immunity is also still large.”

Moreover, an increasing number of brands connect their products to technology. “Ritual is using a social media component to boost compliance. DSM boosted their Ampli D product sales by offering a free vitamin D test. BetterYou is also offering vitamin D at-home test kits.”  
By Jolanda van Hal

### WHO takes action on food fortification to tackle global crisis of hidden hunger

May 2023  
Nutrition Insight



The 76th World Health Assembly - a forum by The World Health Organization (WHO) - has adopted a new resolution to urge member states to address the issue of micronutrient deficiencies, particularly folate, iron, vitamin A and zinc by fortifying foods. Hidden hunger affects half of preschool-aged children and 67% of reproductive women, the organization stresses.

‘Micronutrient deficiencies can lead to spina bifida or other neural tube defects. Meanwhile, it can also result in a fragile immune system,

blindness, diminished exercise and physical deficiencies. The WHO stresses that large-scale food fortification is a part of the solution.

“Mothers with low micronutrients can have babies prematurely or with low birth weight. Iodine deficiency is still prevalent in many countries and it impairs brain development in children, undermining their ability to learn and their eventual productivity,” says the WHO.

Nutritional adequacy is crucial in the first stage of life. Anke Sentko, VP of regulatory affairs and nutrition communication at Beneo, recently told NutritionInsight that

vitamins A, B12, B6, D, C, zinc, copper, iron and selenium play a role in supporting the biochemical pathways necessary for the immune response.

### The solution

Adding essential vitamins and minerals to flours made of wheat and maize flours, rice, oils and other food items can help countries prevent people suffering from micronutrient deficiencies and prevent future populations from experiencing the same, the WHO claims.

“Fortification is an evidence-informed intervention that contributes to preventing, reducing and controlling micronutrient deficiencies. It can be used to correct a demonstrated micronutrient deficiency in the general population (mass or large-scale fortification) or in specific population groups (targeted fortification) such as children, pregnant women and the beneficiaries of social protection programs.”

The organization further says that large-scale food fortification is recommended as its a “powerful evidence-informed and cost-effective intervention to fight the consequences of vitamin and mineral deficiencies, including iodine deficiency disorders, anemia and iron deficiency and neural tube defects, among others.”

The project has been ongoing for decades and collaborations have occurred at community, country and regional levels. Edited by Beatrice Wihlander

## Fast-spreading fungi accelerate losses and could wipe out crops, experts warn

05 May 2023

Nutrition Insight

Fungal diseases are decimating crops, with farmers losing 10% to 23% of their harvests to infections yearly - plus more in postharvest losses.

Diminishing yields threaten



global food security and scientists are urging agencies worldwide to come together to find new ways to combat infection, including exploring technologies like AI and drone use to spot fungi risks faster. A report for the National Library of Medicine reveals that the loss of commodity crops to fungal disease can destabilize the economies of developing nations and that climate change is accelerating the potentially devastating damage caused by fungi.

“Fungal infections are threatening some of our most important crops, from potatoes to grains and bananas. We are already seeing massive losses, and this threatens to become a global catastrophe in light of population growth,” says Sarah Gurr, chair in food security at the University of Exeter and co-author of the report.

Across the five most important calorie crops - rice, wheat, maize (corn), soya beans and potatoes - losses from infections amount to enough food to provide some 600 million to 4 billion people with 2,000 calories every day for one year. Moreover, accelerating climate change is set to worsen the prevalence of fungal infections damaging harvests, according to Nature. Growers in England and Ireland have already



reported wheat stem rust infections, which normally occur in the tropics.

## Resistant seeds and early detection

Innovative farming practices may hold the key to solving the issue. A study in Denmark showed promise by planting seed mixtures that carry a range of genes resistant to fungal infection, according to Gurr. Moreover, in 2020, a team at the University of Exeter discovered a new chemistry that will allow new antifungals to create mechanisms that prevent fungi from developing resistance. The scientists found the new antifungal could be used against *Septoria tritici* blotch on wheat, rice blast and corn smut and against the fungus that causes Panama disease in bananas. “Technology may prove crucial,” Gurr says. Artificial intelligence, citizen science and remote sensing tools such as drones allow for early detection and the control of outbreaks.

The authors reiterate that protecting global crops requires a unified approach that brings together farmers, the agricultural industry, plant breeders, biologists, governments, policymakers and funders.





“Recently, we’ve seen the world unite over the human health threat posed by COVID-19. We now urgently need a globally united approach to tackling fungal infection, with more investment to build on the seeds of hope and stop this developing into a global catastrophe which will see people starve,” Gurr highlights.

### Why are fungi so pervasive?

The scientists warn in the report of a “perfect storm” that is causing fungal infections to spread rapidly. “Among the factors is the fact that fungi are incredibly resilient, remaining viable in the soil for up to 40 years, with airborne spores that can travel between continents. They are also extremely adaptable, with ‘phenomenal’ genetic diversity between and among species,” the researchers explain.

Furthermore, modern farming using vastly genetically uniform crops creates the perfect conditions for a prolific and fast-evolving group of organisms to spread. Fungi are also “well-equipped” to evolve beyond traditional means to control their spread.

“The increasingly widespread use of antifungal treatments that target a single fungal cellular process means fungi can evolve resistance to these fungicides so that they are no longer effective. This forces farmers to use ever-higher

concentrations of fungicide in a bid to control infection, which can accelerate the pace of resistance developing,” detail the scientists.

“Forgotten crops” might be key to boosting the agri sector’s resilience. Through climate niche modelling, new research has identified how forgotten food crops can diversify or replace major staple crops in sub-Saharan Africa by 2070 and benefit micronutrient supply. Food biodiversity is a topic “often missing from conversations,” Dan Saladino, author of “Eating to Extinction: The World’s Rarest Foods and Why We Need to Save Them,” told FoodIngredientsFirst previously.

By Marc Cervera

### Corbion harnesses algae fermentation to develop omega-rich oils

04 May 2023 Nutrition Insight

Corbion has entered the field of human nutrition with algae-based products rich in omega 3 and omega 9, with environmental sustainability at a high focus.

The product range is made from different oils, enabling dietary supplement manufacturers to work with building blocks for precision and higher concentrations. NutritionInsight speaks with Ruud Peerbooms, president of Corbion Algae

Ingredients, about the AlgaVia portfolio. He details that it is available now to supplement manufacturers via leading concentrated Docosahexaenoic acid (DHA) refiners. “Algae fermentation is a rich platform that can provide sustainable active nutrition solutions on different fronts. There is so much to be done in that field. After acquiring TerraVia in 2017, we were able to apply a feasible innovation focus in our R&D efforts. Today we have an over 9,000 strain library that is constantly being improved and developed to produce nutrition,” Peerbooms says.

### Battling nutritional challenges

While detailing the production process, Peerbooms says, “for us, feasible innovation is pivotal - to create solutions that will address our customers’ nutritional challenges and advance their sustainability.” One of the features the company is looking at is the concentration of omega 3 and omega 9 and the strains are developed to be “the best in class in terms of concentration.”





The AlgaVia production setup is designed for achieving zero impact on the ocean, Peerbooms says. Corbion takes these selected improved strains, once sourced from nature, and transforms them into omega 3 and omega 9 in oil format. The algae are grown via a closed fermentation system independent of light and using sugar from sugarcane - one of the world's most productive sugar sources compared to other sugar feedstock sources like corn and wheat.

“According to different organizations such as the Food and Agriculture Organization and the World Health Organization, many different nutritional challenges must be tackled. Food and nutrition production impacts our climate and ecosystems enormously,” Peerbooms underscores. “For us, these challenges need to be addressed sustainably within the planetary boundaries. Innovation is required to address the gap and to achieve a balance between planetary and healthy boundaries.”  
By Beatrice Wihlander

**Experts tip stress relief, mood health and enhanced cognition as key priorities for nutraceutical consumers**  
03 May 2023 Nutrition Insight

The market for mood and

mental health-boosting nutrition supplements continues to grow, aided by increasing consumer interest in mental and emotional well-being and an expanding product offer from nutrition companies.

Innova Market Insights reports that 28% of global consumers expressed concerns over their mental health. In comparison, 36% believe a functional product could benefit them by improving their mood and combating anxiety and sadness.

NutritionInsight speaks with experts from Lubrizol Life Science, Nexira and Roquette about the latest developments in nutraceuticals targeting mental health and well-being. “The fast pace of modern life places a range of demands on our minds and bodies, so ingredients that support stress relief, mood health and enhanced cognition are key priorities for consumers right now,” affirms Arnaud Verhaeghe, marketing director of Pharma Oral Dosage at Roquette.

Julie Imperato, marketing and communication manager at Nexira notes that mental health is a significant part of holistic health, with 46% of consumers planning to improve their mental well-being in the next twelve months.

**Ingredients for mental well-being**

Cannabis' compound cannabidiol (CBD), which stimulates relaxation, is the star ingredient within new launches targeting mental health. The body of scientific



evidence behind its mental well-being benefits continues to grow, notes Verhaeghe. “The quest for mental well-being extends beyond CBD. In the gut health space, we’re seeing a move from claims focusing on digestion and metabolism to mental performance and immunity, especially,” he continues. “The post-COVID interest in probiotics and their immune-supporting benefits hasn’t dissipated. Google Trends data shows a consistent level of searches for the topic over the past year.”

Research is highlighting the potential of probiotics as an alternative to antidepressants. “From a cognitive health perspective, more consumers have resorted to nutritional supplementation through caffeine,” adds Isabel Gomez, global marketing manager of Nutraceutical Ingredients at Lubrizol Life Science. “In hopes of having an extended, slower release effect over regular caffeine, consumers want to boost alertness and maximize their cognitive function and performance on both physical and mental tasks.”





### Prioritizing the self

Verhaeghe notes that there is a prominent desire to ‘invest in the self,’ particularly among millennial and Gen Z consumers. This demographic is most inclined to spend on products that support health, well-being and inner happiness. “These groups are also far more focused on ‘self-searching’ and introspection than we have previously seen - identifying the best products for their specific health goals, as opposed to industry trends dictating their needs to them,” adds Verhaeghe.

Gomez states that consumers are also increasingly interested in products that help improve sleep quality and reduce stress and anxiety. Product launches with claims about stress, mood and sleep support are increasing. “For this reason, we see a growth in the launch of products with claims referring to stress, mood and sleep support, have a steady increase in the share of supplements launch activity, perhaps holding a mirror to the wellness needs of today’s consumers.”



“When seeking out such products, consumers will emphasize products having shortened ingredient lists, containing only trusted ingredients and product claims being trustworthy and clinically substantiated.”

By Jolanda van Hal

### Mixing spinach with cow or coconut milk maximizes antioxidant content, study suggests

02 May 2023 Nutrition Insight

Swedish researchers found that using high- and medium-fat cow’s milk and coconut milk in spinach smoothies may make it easier to digest the antioxidant lutein from the leafy green.

“Cow’s milk, in general, performs better than plant-based products,” lead author Rosanna Chung, assistant professor in the Department of Health, Medicine and Caring Sciences at Linköping University, Sweden, tells NutritionInsight. She adds that it has become popular to use plant-based liquids or to add fibres to spinach smoothies, but that “most plant-based liquids do not help lutein to release and some may even have negative effects on lutein levels in smoothies.”

“We previously found that consumption methods could make a significant difference in the levels of lutein from spinach. Using the optimal consumption method, i.e. smoothie-making, we now found that food companions also matter significantly.” Lutein is an antioxidant with anti-inflammatory properties, commonly found in spinach and kale. Lutein is an antioxidant with anti-inflammatory properties, commonly found in spinach



and kale. Studies focused on the potential of lutein in eye health and found it may delay age-related macular degeneration progression.

Lutein health benefits  
In the study, published in *Nutrients*, the researchers explain that lutein needs gastric juice or food components to be liberated from the plant material and absorbed by the gut. “Lutein is not soluble in water while our food and gut environment is full of water. For lutein to ‘come out’ of spinach, it has to be emulsified either by other food components or our digestive juices,” explains Chung. “Many previous studies showed that lutein could suppress inflammation, so increased daily intake of lutein could potentially be beneficial to people suffering chronic inflammation.”

She adds that lutein is better protected against degradation after being emulsified and should be consumed immediately. Earlier research suggested that if the US population with vision problems consumed a daily lutein and zeaxanthin supplement, it could have prevented 21,022 cases of transitioning to severe vision impairment states.

By Jolanda van Hal





“Alternative seafood formulation is much more challenging than that of alternative meat, especially when considering factors such as texture and variety,” Thai Union

## Sea-food from sea-plants: Thai Union sees next stage of alt-protein growth coming from the ocean

By Pearly Neo 24-May-2023 - Food Navigator Asia

The next stage of evolution for the plant-based seafood sector in APAC is likely to come from the sea itself, in the form of proteins from marine-based plants such as seaweed and kelp, according to seafood giant Thai Union.

Thai Union launched its first plant-based product line OMG Meat back in 2021, comprising of both meat and seafood alternatives. So far the plant proteins used in these have come from more conventional sources such as soy and wheat, as well as in-house tech used to make its plant-based shrimp.

But given the firm’s long history with seafood, it has aspirations to look more closely at the ocean to find more marine-affiliated protein sources for its plant-based alternative innovations.

Alternative Proteins Managing Director Maarten Geraets told FoodNavigator-Asia. “Meat texture focuses on characteristics such as toughness and strong fibres, but for seafood the parameters are more wide-ranging including areas like softness, flakiness, succulence, moistness and so on. Also when making alternatives to chicken, pork or beef there is only a need to focus on one type of each - but in seafood there are some 200 species out there which all have different profiles and taste which makes the challenge many times fold. We also believe there is immense potential to develop these with alternative proteins that come from the sea and not the land - making Sea-Food from sea-plants, if you will - and this would tie in very well with Thai Union’s seafood core and our Blue Finance endeavours.”

That said, there are also many more challenges associated with using these marine plant sources, not least the visual aspects of this. “We do intend to focus on fermentation technologies to develop alternative protein products from sources such as algae, seaweed and kelp, but the green colour of these is one of the most obvious challenges,” he added. “Green coloured fish just isn’t logical nor appetising, so we are working

on overcoming this, but do believe that this is the next step for us in the sector - the sustainability benefits are also too immense to ignore, from carbon absorption to regenerative farming, clean oceans and more.”

## Study reveals consumer preference for softer gummies over traditional gelatin-based varieties

By Deniz Ataman 05-Jun-2023 - Food Navigator USA

Cargill's consumer preference study revealed that despite the widespread popularity of gelatin-based gummies, participants overwhelmingly favoured a softer gummy texture made from alternative ingredients like pectin or tapioca.

Food Navigator-USA sat down with Courtney LeDrew, marketing manager at Cargill to discuss the company's recent research on consumer gummy preferences and how the findings can help brands develop gummy candies that appeal to a wide range of consumers.







## AI Customer Foresight platform, focuses on digital transformation in 2025 strategy

By Ryan Daily 05-Jun-2023 - Food Navigator USA



In the study, Cargill's researchers created six distinct formulations of gummies, ranging from firm to soft, which appeared identical in shape, flavour, and size.

Ingredients included gelatin, pectin, carageenan and other hydrocolloids which provide a range of texture profiles. A blind panel of consumers then evaluated and scored their preference for each gummy sample.

The study showed that softer gummies scored the highest. The study also found that gummies made with a combination of pectin, tapioca or corn syrup and starch were the most appealing. Gelatin gummies, which exhibit a chewier texture and gummies with a dense, waxy or sticky mouthfeel and texture scored the lowest.

“What we found was that the gummies that were softer, which were made with a combination of pectin and tapioca, pectin and corn syrup, or pectin, starch and corn syrup...were the ones consumers said they liked more ,” Le Drew explained.



Givaudan is using AI-based capabilities with its Customer Foresight platform to predict upcoming market trends and provide opportunities to co-collaborate with CPG brands on new and innovative food and beverage products, Nandita Prabhu, Customer Foresight Director for Givaudan, told FoodNavigator-USA.

“A key component of Givaudan’s 2025 strategy is a holistic digital transformation, and AI plays an important role. Customer Foresight is a great example of using AI, together with human intelligence, to get to the best result. With Customer Foresight, the AI can consider endless market aspects - from a country and segment to brand dynamics and product attributes. ”

### Delivering technical solutions to flavour and food development

Created at Givaudan’s Digital Factory in Paris, France, the Customer Foresight platform blends AI technology and Givaudan’s proprietary data and expertise, Prabhu said. On the technology side, the Customer Foresight platform analyzes data and predicts potential upcoming trends, she said. And on the personnel side, a team of Customer Foresight experts, dubbed

futureescapers, will serve as the “intermediary between our platform and our customers,” running scenarios that’ll lead to the creation of concepts and ultimately products, she added.

“The scope of applications is vast, but the aim is always to anticipate and shape the future by looking much further into the horizon. To illustrate the scope, we could imagine using the tool to answer such questions as, ‘What food and beverage product should we be launching next?, ‘How will climate change agendas evolve by 2030?,’ and ‘By 2030, how will health and nutritional needs of consumers evolve?’ ”

“AI technology is a hot topic, and we have been using it for some time to help us offer even more progressive food and beverage experiences for our customers: delivered in less time, more innovatively and with more precision. That said we see the human intervention piece continuing to augment smart technology and we don't see this going away. ”





## Functional ingredients key to attracting busy, health-conscious consumers through holistic nutrition offerings

By Teodora Lyubomirova  
05-Jun-2023 - Food Navigator  
USA

As shoppers seek more bang for their buck, research carried out by Fonterra's health and wellbeing B2B brand Nutiani highlights the role of science-backed functional ingredients as a means to add value to nutrition products.

Cost remains a key consideration for consumers when evaluating nutrition products, according to Nutiani's third Global State of Health and Wellbeing Report, based on findings from the company's 2021 IPSOS Nutiani Consumer Wellness Research and Consumer Segmentation Research, which involved 5,000 global consumers.

Of those surveyed, 86% turn to functional and fortified foods and beverages to boost their health - and so-called multifunctional benefits are the top health claim consumers would like to see on product labels. This is based on a desire to address multiple wellbeing factors all at once. But as cost remains a barrier for many - with 38% of those

polled stating they are concerned about the affordability of nutrition products - formulating products that provide multiple health benefits could prove a winning formula for manufacturers. This can be done by integrating functional ingredients such as probiotics and phospholipids into solutions that would address multiple health concerns at once. According to Nutiani, choosing science-backed ingredients that have no impact on flavour - with taste being a barrier for 14% of consumers - and can be added to a variety of food applications is one way to unlocking new categories of nutrition solutions.

Consumers across a wide age range can be attracted by such products - from busy professionals aged 25-44 looking for convenient holistic health solutions, to 45-70 year-olds who are proactively seeking solutions for their health management. According to the report, American consumers have an especially holistic perspective of health, with almost 9 in 10 stating that cognitive and mental health is on a par with physical health in terms of importance.

Meanwhile, consumers in Japan and China are more likely to pay close attention to the ingredient list of products or the presence of science-backed claims. But consumer education is needed to attract younger consumer groups (aged 16-24) who tend to be less knowledgeable about the link between health and nutrition.

Charlotte Ortiz, global brand marketing manager of Nutiani, commented: "Our research supports what our customers and industry experts are saying. Consumers are becoming more sophisticated in their understanding of how health issues are interconnected, and how concerns in one area of their physical, mental or inner health can have a ripple on effect on their overall wellbeing. "Supporting any health claims made about multifunctional benefits with rigorous, clinical evidence is also crucial in overcoming scepticism to build consumer confidence and establish credibility."

According to The Insight Partners, the fortified dairy products market is expected to grow from \$115bn in 2022 to \$170bn by 2028 at a CAGR of 6.5%. The demand for fortified dairy products is expected to increase, owing to the rising awareness of the health benefits they provide as well as increasing concerns regarding wellbeing and fitness.

The milk segment is expected to register the highest CAGR, with fortified milks and yogurts able to offer a holistic option to consumers to meet the recommended daily intake target of key vitamins and minerals more conveniently.





Image © neggst.co



## Next level eggs: Neggst's plant-based eggs are on the verge of cracking into the market

By Deniz Ataman 06-Jun-2023 - Food Navigator USA  
 FoodNavigator-USA sat down with Neggst's CEO, Verónica García Arteaga, during the NYC Vegan Women Summit to discuss the company's plans to scale up and the brand's technical considerations in producing a plant-based egg that resembles a chicken egg from the yolk to the shell.

After raising over \$4 million in funding, Berlin-based Neggst plans to produce its plant-based egg white and yolks through prototyped machinery. The company plans to first scale up in Germany before reaching the European and US markets.

By the year's end, Neggst aims to introduce its prototype machine that will demonstrate its capability of producing automatic and accurate plant-based eggs. Currently, Arteaga explained, the process of creating the egg membranes is done manually. "The idea is when we have this machine, we can scale up [production], which should be ready by almost the end of the year. Then we can have a proof of concept of this machine to create around 10,000 eggs per day," she explained.

Neggst's plant-based eggs are featured in two formats: a bottled liquid and a shelled egg made of biodegradable polymers, or a fermented plastic mixed in with minerals, Arteaga clarified. The eggs are made of pea protein and fava beans, algae to create the texture, as well as sweetpotato and carotene for color; while the egg yolk membrane is created with calcium and algae. "The idea was to have a product that can resemble a chicken egg and then give the consumer the experience of it," she said.

## Plant-based ice cream market grows as formulation challenges persist

By Ryan Daily 07-Jun-2023 - Food Navigator USA

As the plant-based ice cream market expands with a range of flavours and formats, innovation in the space will need to better recreate the taste, texture, and mouthfeel of animal-based counterparts to entice consumers into the category, Christine Usmen, senior marketing manager of Olam Food Ingredients, told FoodNavigator-USA.

While the parts of the plant-based market are experiencing growing pains, the plant-based milk category is growing, and the plant-based ice cream market – which often uses

plant-based milks as a base – has an opportunity to expand its retail shelf space, Usmen said. "The plant-based dairy category is certainly growing. Milk was actually the category to grow before alternative meats kind of took off, and the plant-based ice cream specifically is still in the very early stages of growth, and we do see that there is demand for it."

The global plant-based ice cream market was estimated to be worth \$1.6bn in 2022 and expected to grow to \$4.3bn by 2033 with a 10% CAGR from 2023 to 2033, spurred by adoption from younger generations, according to Future Market Insights research.

The plant-based ice cream market also has the "biggest gap among plant-based dairy categories ... between penetration and the desire for it," Usmen said. Over 50% of consumers said that they would be more willing to try plant-based ice cream if more options were readily available, according to



Olam Food Ingredients research, she added.

Looking at Innova data for the last five years, the ice cream and frozen yogurt category saw 2,876 product launches, and the non-dairy ice cream and frozen yogurt segment only saw 787 launches, Usmen said.



And while there are some indications that plant-based milks are taking market share away from their animal-based counterpart, Usmen sees the two more as complementary of one another. Olam Food Ingredients found in a survey of over 1,500 consumers that 67% said that they see plant-based dairy as complementary to dairy products, while 65% said they see plant-based dairy products as an opportunity to try something new.

Another market barrier is recreating the taste, texture, and mouthfeel of traditional animal-based ice cream in a plant-based format, which has been a persistent challenge in the overall plant-based category, Usmen explained. In a separate survey of over 1,500 US consumers, 7% of them switched back to a dairy product after trying a plant-based product and not liking it. “Consumers expect ice cream to be really indulgent and have this mouthfeel that’s really creamy and rich. And most plant-based milks on the market just don’t have that fat and protein content to get that rich texture if you just do a simple substitution. ”

To address these formulation challenges, CPG brands need to ensure the right amount of fat and protein in their products, Usmen explained. One solution is using popular plant-based milks as the base of the ice cream formulation, she said. For instance, a coconut milk base can have the right ratio of fat and protein, which can recreate the taste of animal-based ice cream, she added.

### Plant-based fat mimics the texture of animal fat in bakery products

By Augustus Bambridge-Sutton  
07-Jun-2023 - Food Navigator USA

Some products, such as croissants, need a bit of butter to get their unique texture. Israeli startup GavenTechnologies hopes to provide a vegan replacement of butter and other animal fats in bakery products, with its new plant-based fat FaTRIX.

FaTRIX offers a protein-based alternative to butter and other animal fats found in pastries and bakery products. According to CEO and co-founder Itai Cohen, previous attempts at replacing fat in these products with vegetable fats ‘cannot match’ the taste and texture of their animal



counterpart.

The fat substitute FaTRIX is composed of extracted protein, acting as a base on which water and plant oil are bound. It has a high melting point and fat-holding capacity, which means that leaching (chemically interacting with cookware), is unlikely. The product can be made with any plant oil, meaning that it can be customised. This also means that sustainability concerns with some plant oils, such as soybean oil, can be mitigated.

One of the aims of the fat substitute was to provide consumers with the taste and texture of animal fat in bakery products. For a long time, Cohen told us, this has not been achieved. And previous substitutes were unhealthy to boot. “Butter substitutes such as margarine and tropical oils fail to deliver the desirable texture and taste of butter. Moreover, they exhibited a significantly poor nutritional profile as the amount of saturated fat is much higher.”



# REGULATORY NEWS



detail in the guideline.”

The new guidance includes all synthetic, naturally occurring or modified non-nutritive sweeteners not classified as sugars, found in manufactured F&B or sold independently. Common NSS include acesulfame K, aspartame, advantame, cyclamates, neotame, saccharin, sucralose, stevia and its derivatives.

Vicky Pyrogianni, Nutrition Science director at the International Sweeteners Association (ISA) tells us that the “WHO recommendation is inconsistent with the global integrated approach to addressing noncommunicable diseases to which WHO and its Member States have committed, of which sugar reduction reformulation of foods and drinks is an integral part.” Non-sugar sweeteners include acesulfame K, aspartame, advantame, cyclamates, neotame, saccharin, sucralose and stevia. “There is no scientific evidence to support avoiding their use and, crucially, they are already playing an essential role in helping food and drink companies reduce or eliminate the amount of sugar in their products.”

## WHO advises against non-sugar sweeteners for weight control, experts flag scientific limitations

17 May 2023 Nutrition Insight

The World Health Organization (WHO) has stated long-term use of non-sugar sweeteners (NSS) does not have long-term benefits in reducing body weight and may have undesirable effects, such as the risk of type 2 diabetes, cardiovascular diseases and premature mortality in adults. However, some experts find the supporting evidence insufficient.

“What we hope to achieve with this guideline and other existing and forthcoming guidelines on healthy diets is an overall improvement of dietary quality,” Jason Montez, a scientist in the Department of Nutrition and Food Safety at the WHO, tells NutritionInsight.

“The guideline is based on a systematic review of the scientific literature published in 2022, including more than 280 studies. The guideline and the recommendation contained within were developed following the WHO guideline development process, which is a rigorous, structured and transparent process and is described in



### Short-term benefits

As evidence supports the role of non-sugar sweeteners in reducing calories in the short term, it can be part of interventions to manage weight, notes Nita Forouhi from the MRC Epidemiology Unity at the University of Cambridge, UK. "The duration of most of the RCTs was very short, mostly a couple of weeks or under three months, while very few were longer than six months and of around 50 RCTs, only five were of one year or longer duration."

Although replacing sugar with sweeteners alone is unlikely to improve diet quality and produce necessary changes to control weight long term, it may be a way to reduce overall sugar intake for some people, notes Dr. Duane Mellor, dietitian and lecturer at Aston University, UK. "The report focuses heavily on the observational studies which can only show an association between non-sugar sweeteners and a health outcome, in this case largely weight control, rather than clinical trials which are better at showing causal links."

Researchers indicate that the scientific evidence for the guidance was of low or very low certainty, with limited proven causal links. "In the case of sweeteners, several trials have shown that they can help with weight control,

whereas observational studies may not show an association between sweeteners and weight control."

### Industry response

The ISA aims to work with the WHO to ensure the benefits of low and no calorie sweeteners are fully understood, adds Pyrogianni. "Low and no calorie sweeteners enable food and beverage companies to reformulate products to contain less sugar and fewer calories, ultimately supporting public health objectives - including from the WHO - to reduce sugar and calorie consumption," she continues.

"Low or no calorie sweeteners are safe to use, one of the most thoroughly researched ingredients in the world and have been approved by all major food safety authorities. They also assist with weight management by allowing consumers to enjoy food and drinks that have less sugar and fewer calories, while still meeting taste preferences."

"In my opinion, this advice is likely to cause a lot of confusion in the public health arena because the sugar levy in the UK has drinks manufacturers replacing some or all of the sugar with artificial sweeteners," concludes Tom Sanders, professor emeritus of Nutrition and Dietetics at King's College London, UK. Last year, sugar industry members flagged that sugar reduction guidance by the European Food Safety Authority could lead to an increase in artificial sweeteners.

By Jolanda van Hal



### Name of the game: Can there be a consensus on how to name meat products grown in a lab?

By Si Ying Thian 10-May-2023 - Food Navigator Asia

Cell-based meat? Cultivated meat? Differing views have been put forward by the FAO, WHO and industry players in APAC in defining the product, even though everyone seems to acknowledge that a common language is key for consumer education. The FAO and WHO preferred to use "cell-based food" term in its recent report into the category.

It claimed that a literature review conducted elicited that the "cell-based food" term was "less confusing, conveniently overarching and generally well-accepted by consumers", and accurately reflects the science of the product.





It added why other terms were not used: “The terms “cultured” and “cultivated” can be confusing as they are often used in the aquaculture sector to indicate farmed fish and fisheries. The term “cellular agriculture” can be considered too general as it may include the topic of plant cell culturing or fermentation.”

In the regional camp, the APAC Cellular Society for Agriculture (APAC-SCA) and Good Food Institute (GFI-APAC) reached a consensus on “cultivated meat” via an MOU signed in October 2022, involving over 30 food companies in the region.

“We understand that there might be variations in translation from country to country or across different languages - but generally, supportive to adoption of ‘Cultivated’ as a whole,” APAC-SCA programme manager, Peter Yu, told FoodNavigator-Asia.

The MOU expounded on the “cultivated meat” term being the “most effective at fostering consistently positive responses from consumers. Importantly, it is also a scientifically accurate term that clearly distinguishes foods that are cultivated from animal cells from other existing products in the marketplace.”

TissenBioFarm's chief strategy officer, Yeonjoo La, said that it is adopting the term set by the MOU: “We used to use cultured meat because in my opinion, it was easier to understand what it means and easier to

pronounce too. When I did some consumer research, the top two candidates were cultivated meat and cultured meat. We did not have a strong preference between both, so we were okay to follow GFI’s guidance as they are actively working to advance the industry and they work a lot with other cultivated meat players and government agencies. We could support them in that way.”

Despite differing opinions, both global and regional parties acknowledged a convergence or international harmonization for the cultivated meat term, citing reasons related to research progress and consumer education.

The FAO and WHO report stated: “[Technical Panel] experts have suggested to have good studies before considering international harmonization of the terminology. “Adoption and consistent use of consistent nomenclature across commodities/ species and used by all stakeholders can help consumers better understand the products and processes and can create a common search term that may be used to find more information about them.”

“It would not be surprising if a convergence appears in the

future on at least a few terms, based on trends such as global coordination and alignment (e.g., regional MOU), alongside the understanding on the importance of convergence, and academia and other institutions conducting surveys [on the accepted term],” Yu said.

Cultural variations to the term may complicate the process of reaching an international harmonization of terminology. “The use of the term “meat” to refer to a cell-based food product might not be acceptable in all regions. Calling the product “meat” may also complicate halal or kosher labelling, as the religious status of this new product might depend mostly on its production methods (e.g., cell sourcing, other inputs).

“Other stakeholders, such as some conventional meat producers, may also object to using the term “meat” in connection with cell-based food. Hybrid products, which include plant-based or other ingredients in varying percentages, also complicate using the term “meat”, and in fact some countries already do not allow using this term for them,” the FAO and WHO report stated.





## ‘Samples Only’: Philippines FDA sets strict import guidelines for unregistered food products used for R&D

By Pearly Neo 10-May-2023 - Food Navigator Asia

The Philippines Food and Drug Administration is implementing new strict import guidelines for food and beverage items that manufacturers want to use for R&D.

The new guidelines mandate food firms that are importing food and beverage items which are not registered or approved by the local authority to secure a specialised form of import permit, which will specify said products as ‘Samples Only’.

“The application for this permit will only be entertained for food manufacturers/importers with food manufacturing or processing activities, food distributors engaged in imports for R&D purposes and so on - it will not be applicable for firms looking to perform market testing to consumers,” the Philippines FDA stated via formal documentation.

“The main scope will be for finished products or ingredients which have completed the manufacturing

process but are not yet sold here, and this importation must be handled by the applicant for the research and development of its own product or as a sample by another establishment it has registered in the

application. “These imported food products are prohibited from market testing to consumers or display in any commercial facilities, trial runs or actual selling of the products - any taste testing can only be limited to the sensory panel employed by the applicant.”

The guidelines further specified that a sensory panel must comprise of a group of trained testers with ‘exceptional sensory faculties and can describe products on the basis of taste, smell or feel’ and have received special training to ‘describe their sensory experience words that are more detailed than those used by consumers and more useful for the research and development department’.

While this new arrangement is expected to improve the application efficiency for firms looking to bring in new products solely for research purposes, the FDA has also established strict limits for each imported item in order to ensure local food safety. “The maximum limits for each imported product intended as samples will be determined per variant or type, and specified in the Invoice received,” the agency added. “Maximum

weight limits have been determined as 50kg per item for all finished products, 50kg or 50L for all raw food materials, 5kg per variant of food supplement (in the form of capsules, powder or tablets), and 5kg or 5L for accepted food additives.”

## Health, environment or lactose intolerance: Why do people drink plant-based milk?

By Augustus Bambridge-Sutton 05-Jun-2023 - Food Navigator USA

Plant-based milk is one of the most successful categories of alternative protein, predicted to reach a value of \$47 Billion by 2030. But why is it so successful? The driving force behind any alternative protein’s success is the motives people have for choosing it over animal protein.

Ever since soya milk first appeared commercially in 1910, created by Chinese biologist Li Yu-Ying, plant-based milk provided a key alternative for those who wished to reject animal milk. But plant-based milk has a more complex role than its brethren in the meat alternative world.







Unlike plant-based meat, which acts primarily as a substitute for people choosing not to eat meat for health, environmental, ethical, or religious reasons, plant-based milk has another prominent purpose - to provide milk to people with lactose intolerance, which affects a significant percentage of the world's population.

### How important is this factor?

The available market is not small. Lactose intolerance is widespread. In China, for example, which until recently had the world's biggest population, 85% of people are lactose intolerant. Some countries, such as Ghana, Malawi, Yemen and South Korea, have a lactose intolerance rate of 100%. It's even high in some European countries, such as Italy (72%) and Ukraine (61%).

However, the dairy industry is also a key emitter of greenhouse gasses. In fact, emissions stemming from dairy make up 3.4% of total global emissions - nearly double that of aviation, which arguably gets far more coverage in the news cycle. Then there are the ethical reasons. Many vegans object to the cruel treatment dairy cows experience, which includes being kept, artificially, in a state where they can produce large volumes of milk, which leaves them exhausted and in pain.

Finally, there are health concerns. While most plant-based milks have a lower protein and iodine content than dairy milk, they are also lower in saturated fat, which is often linked to health complications. It is important for the plant-based milk industry to know who they are targeting, and why people are making the decision to eschew dairy from animals in favour of plant-based milk.

### In pursuit of health

The main reason that people choose to switch to plant-based milk is, in fact, for health. According to data from the Voice of the Consumer: Health and Nutrition Survey (2023), a survey by market research company Euromonitor International, over 30% of people questioned on why they drink plant-based milk said that their main reason was 'to feel healthier.'

The "main reason is perception of these products as healthy," Maria Mascaraque, Food and Nutrition Global Expert at Euromonitor International, told FoodNavigator. "According to Euromonitor's survey. . . 1 in 3 (33.4%) global consumers consume plant-based dairy alternatives "to feel healthier". Conversely, less than 10% of people gave the reason for choosing them as 'I am allergic/intolerant to dairy'. However, 19.4% of people said that they prefer plant-based milks because they digest them better. Mascaraque suggested that there may be some overlap in the two categories.



"Regarding lactose intolerance, I think we need to differentiate between the people who actually have an intolerance and the ones that think lactose is bad for them or feel they don't digest it well," she said. "We don't have a lactose specific answer in the survey for the plant-based dairy question below but the two responses that connect best with this topic is the 'digestion' one which ranks high across markets and the one on 'to reduce sugar intake' as lactose is sugar after all ." The category 'to reduce sugar intake' got 13.8%.

### Greenwashing: Companies urged to ensure label claims are substantiated in light of proposed EU directive

By Teodora Lyubomirova 12-Jun-2023 - Food Navigator Asia

Leatherhead Food Research has warned that food companies must act now to ensure their sustainability claims can stand up to the scrutiny of EU regulators if a draft directive came into force in 2024.





more than alternatives perceived as less environmentally-friendly.

Mariko Kubo, head of scientific and regulatory affairs at the consultancy, told DairyReporter: “Green claims are voluntary in the UK and EU, so in some cases the easiest option may be to not make any green claims at all until the legislation (particularly in EU) is clearer. Where green claims are made, they need to be presented in a specific, precise and unambiguous manner, without key information being omitted.

“All food business operators, including dairy and alt dairy producers, will need credible scientific evidence to support their green claims and should be prepared to share this in a clear understandable format in the event that the claim is challenged.”

“They should also ensure claims are supported by validated data where appropriate. One common pitfall, specifically for green claims used in advertising but also relevant for claims on labels is not taking the whole lifecycle of a product/food into account when making the claim.

Asked how the UK Code compares to the EU directive, Kubo said: “The EU directive is still in draft form so we don’t know what the final



version will look like yet. However, there are common themes between the EU and UK, namely that claims must be clear, not misleading and backed with evidence. There is also a parallel in the proposed amendment to the EU’s Unfair Commercial Practices Directive and the UK’s Green Claims Code - environmental features.

## FSSAI directs laboratories to strengthen testing infrastructure for organic products

FoodTechBiz Desk 27 Jun 2023

**The Government has decided to promote organic products in India by encouraging and strengthening cooperative societies.**

The success of this depends on reliable testing to ensure the authenticity of the organic products. Therefore, all food testing laboratories need to optimize their facilities and procedures to handle organic testing efficiently and accurately.



The European Commission’s Green Claims Directive aims to weed out unsubstantiated label claims that can mislead consumers by giving a false impression of the company’s environmental impacts or benefits - a practice known as ‘greenwashing’ - from credible and trustworthy eco-labels.

Leatherfood Food Research, a consultancy that provides scientific and regulatory guidance to the global food and beverage industry, said businesses that operate in the EU should act now to avoid potential reputational damage. Meanwhile, UK-based operations have been told that the Competition and Markets Authority is already enforcing its own Green Claims Code and announced in January 2023 that household products, including food and beverages, would be under scrutiny.

The consultancy conducted research in Denmark, France, Germany, Greece, Italy, Spain, Turkey and the UK among 10,234 adults to gauge consumer attitudes to green claims. The results showed that 37% of adults had purchased grocery products due to their green claims, while 34% said they had selected a different brand due to green claims, and 30% had chosen a product that cost





FSSAI has directed laboratories under sections 43(1) and 43(2) of the FSS Act 2006 for Organic testing to review their current capabilities and take the necessary steps to enhance the infrastructure and scope of the testing for organic products. All the testing facilities to make an application to APEDA for recognition of the laboratory for testing organic products.

FSSAI has also asked them to apply to the National Referral Laboratory of APEDA for participation in proficiency testing as a pre-requisite to qualify for pre-export testing of organic products.

### FSSAI likely to tone down order on mandatory testing norms

K V Kurmanath, Hindu Business Line, June 23, 2023

In a relief to small food business operators, the Food Safety and Standards Authority of India (FSSAI) has agreed to tone down its recent order that called for mandatory testing of products manufactured by all food business operators (FBOs).

Responding to the concerns expressed by activists and small FBOs, the FSSAI said it examines options to provide minimal parameters for testing in the respective product category. “Keeping in view a large number of representations received from stakeholders, especially the micro, small, and medium enterprises (MSME) sector, that expressed concerns such as testing costs, we are exploring options to provide minimal parameters to be tested without compromising the food safety,” Ganesh Vishweshwar Bhat, Technical Officer (Regulatory Compliance), FSSAI, said. In a response sent to Alliance for Sustainable & Holistic Agriculture (ASHA), he said the tweak in the order would ease the burden of FBOs, especially regarding the testing fees.

A recent FSSAI order directed all the FBOs to get tests done on their products and upload the results every six months. The ASHA lodged a strong protest with the authority early this month, alleging that the move would cause a severe financial burden on small FBOs, who don’t have the financial wherewithal to conform to the order.

Stating that it’s the government’s responsibility to test the food products, he said the order puts the onus on small FBOs. It pointed out that small FBOs (with less than a turnover of Rs 12 lakhs) are only required to register with the FSSAI. (Small operators have a

production ceiling of 100 litres or kilograms a day). The FSSAI, however, said that the order provisions align with FSSAI’s mandate to ensure the availability of safe and wholesome food for human consumption.

“In order to ensure food safety by the manufacturers, testing of food products at least once in six months by the licensed food manufacturers has been made mandatory since August 5, 2011,” the FSSAI official said in his letter. “One of the conditions that a licensed manufacturer must meet is to ensure testing of relevant chemical and/or microbiological contaminants in food products in accordance with these regulations as frequently as required,” he said.



These tests will be conducted at the NABL-accredited FSSAI-notified laboratories at least once in six months. He said the FSSAI’s January 2023 order directed the licensed players to follow the regulations and upload test reports on the Food Safety Compliance System portal.





India, aspiring to become a leader in the global nutraceuticals market projected to reach USD 18 billion by 2025, has introduced supportive measures such as allowing 100

per cent Foreign Direct Investment (FDI) in the food processing industry. This enables nutraceutical industry players to market their products through various channels.

The FSSAI has recently initiated enforcement drives to verify compliance with regulations concerning

nutraceuticals and health supplements. This aims to curb the availability of non-compliant products, including those surpassing recommended nutrient levels, containing unauthorised ingredients, or making false claims.

## FSSAI Developing Mandatory Standards for Nutraceuticals to Regulate Market

*Presently, nutraceuticals fall under various categories in different countries, lacking global harmonisation in classification and regulation*

22 June, 2023 by Business World Online Bureau

The Food Safety and Standards Authority of India (FSSAI) is collaborating with experts to establish mandatory standards for nutraceuticals, aiming to regulate the market and promote its growth.



The move intends to ensure the delivery of quality and reliable products to consumers while urging nutraceutical companies to prioritise product quality, safety, and efficacy across the supply chain.

Presently, nutraceuticals fall under various categories in different countries, lacking global harmonisation in classification and regulation.

## FSSAI Warns HP Nutraceutical Firms; Launches Drive To Curb Menace of Spurious Products

SHAHINA K. K.  
Outlook PTI 21 JUN 2023

Food regulator FSSAI has issued a stern warning to

nutraceutical firms in Himachal Pradesh to strictly follow the regulations as part of its efforts to curb the menace of spurious products.

FSSAI has launched a surveillance drive to curb the menace of spurious drugs manufactured by nutraceutical companies operating across the country, it said in a statement.

The National Human Rights Commission (NHRC) has taken cognisance of reports claiming that an industrial area in Himachal Pradesh has become a hub for producing spurious vitamins, syrups, and drugs in the name of food supplements, and sent notices to the Health Ministry and the Drug Controller General of India.







### Food regulator FSSAI to come up with stricter norms for ready-to-eat food sold in plastic wrap

Ambarish Pandey May 31, 2023 ZeeBiz Webdesk



The FSSAI has initiated its first set of drives in Himachal Pradesh. It has directed its Regional Office, North, to take immediate action against the defaulting Food Business Operators (FBOs) involved in the production of spurious drugs.

"As part of this drive, 21 facilities operating in Baddi, Himachal Pradesh were inspected and 111 samples have been lifted during 7th to 9th June, 2023," the statement said. Further, 25-30 per cent of the nutraceuticals manufacturing facilities in Himachal Pradesh will be inspected by the end of June 2023.

To address this issue, FSSAI's CEO convened a meeting with major manufacturers of health supplements and nutraceuticals of Baddi, Himachal Pradesh on Tuesday here. During the meeting, the CEO issued a "stern warning, emphasizing the absolute necessity for strict compliance with nutraceutical regulations."



The Food Safety and Standards Authority of India (FSSAI), the food regulator of India under the Ministry of Health & Family Welfare, may soon issue guidelines on ready-to-eat food sold in plastic wrap.

These guidelines will aim to ensure the sellers are maintaining the quality of food that is sold without any information on its wrapper.

According to the new guidelines, shops will have to provide customers with all information regarding the product, such as its expiration date, from where it has been sourced, and all other details that are mentioned on packaged food.

### FSSAI to Conduct Nationwide Surveillance to Curb Milk Adulteration

Shivangi Rai Updated 27 May, 2023

The Food Safety and Standards Authority of India (FSSAI) announced plans to conduct

nationwide surveillance of milk and milk products in an effort to combat adulteration.

This extensive surveillance will involve collecting samples from both the organized and unorganized sectors in all districts across the country. According to an English news daily, the samples will include products like paneer, butter, ghee, curd, khoa, chenna, and ice cream.

The objective is to ensure compliance with quality and safety standards and to identify areas where adulteration is prevalent thereby allowing appropriate corrective actions.

Milk was chosen as the focus due to its significant role in Indian food culture, being consumed as a fresh fluid or in processed dairy products. Milk provides essential micronutrients and macronutrients, making it a staple in the diets of people of all age groups.





## The era of transparent packaging: What brands need to know about FSSAI's new packaging regulations

May 8, 2023 Shashwat Das,  
Almond Branding

In recent years, the Food Safety and Standards Authority of India (FSSAI) has been raising the bar when it comes to food safety and nutritional information. They want you to spill the beans on what's really in your products, so your customers can make informed decisions about what they are consuming. Don't worry, it's not like you're giving away your secret spice blend - just a little transparency to keep everyone happy and healthy.

The FSSAI has released the Food Safety and Standards (Advertising and Claims) Second Amendment Regulations of 2022, which entail a set of modifications to advertising and claims on food products. Under the new regulations, brands are required to provide more transparent information on

food packaging and can be held accountable for the accuracy of any advertisements and claims made on labels.

For instance, you can classify your food product as "low fat" only if it contains 3 grams or less of fat per 100 grams, while "fat-free" can be used only if the fat content is less than 0.5 grams per 100 grams. Similarly, "low sugar" can be stated on the label only if the product has 5 grams or less of sugar per 100 grams.

The same type of conditions applies to other nutrients like protein, cholesterol, vitamins, dietary fibre, gluten, etc. Additionally, claims such as "no added salt" can be made only if neither the food item nor its ingredients contain any sodium salts or substitutes.

Moreover, the regulations aim to restrict the use of adjectives such as "natural," "fresh," "pure," etc., as part of brand names and trademarks. Under the new regulations, brands will be required to display this information prominently on the front of the packaging in specific font sizes.

If your food product claims to reduce the risk of a particular health condition or disease,

you will have to specify the amount of food that needs to be consumed per day for the claim to be valid. Additionally, there are other disclosure requirements related to the quantities of nutrients and micronutrients present in food items.



As a brand operating in the packaged food space, it is crucial to keep up with these changing norms from the FSSAI.

The FSSAI's new regulations are aimed at improving food safety and nutrition for consumers in India. As a brand operating in the packaged food space, it is important to stay up-to-date with these changing norms and take the necessary steps to ensure compliance. By doing so, brands can build trust with consumers and position themselves as leaders in the industry when it comes to providing clear and concise information about the nutritional value of their products.

