FOOD, NUTRITION & SAFETY MAGAZINE
PFNDAI
BULLETIN FEB 2024

UNVEILING NATURE'S SWEETEST SECRET: STEVIOL GLYCOSIDES

Ms Shilpa Dhar & Ms Srishti Mukadam

MULTI-SOURCE EDIBLE OILS: AN EMERGING SOLUTION FOR INDIAN COOKING (PART 1)

Ms Fatema Noorani & Dr Agatha Betsy

CAFFEINE: UNLOCKING ITS HEALTH BENEFITS!

Ms Merlyn Mascarenhas

ENHANCING TEXTURE, TASTE, AND SHELF LIFE: THE IMPORTANT ROLE OF EMULSIFIERS IN BAKERY PRODUCTS

Ms. Samreen Shaikh

FROM HARVEST TO HEALING: UNVEILING THE JOURNEY OF GINGER

Ms Simran Vichare & Ms Merlyn Mascarenhas

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 Website: www.pfndai.org

JRS Fibers for Life.

VITACEL® 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

FIL
Flavours

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

FIL
Flavours

Tel : 044 - 26531336 / 2653 0572 / 2653 0451 / 2653 0452
email : info@foodingredientspecialities.com / foodinfil@gmail.com

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

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

PFNDAI **Bulletin** FEB 2024
FOOD, NUTRITION & SAFETY MAGAZINE

INDEX

Cover Design & Layout by Ms. Leena Shanbhag

PROTEIN BOOST IN TRADITIONAL DIETS

There is protein deficiency among most Indians. There are many types of solutions. We can use combinations of cereals and pulses that improves not just the quantity but also the quality of protein.

This is the age-old solution that we have been taught for decades and traditionally Indians have been practicing for centuries. Rice and dal as well as roti and dal or rajma have been consumed all over India. There is also rice and urad used in dosa and idli which work on the same principle.

However, pulses have become so expensive and are likely to be even more expensive in future. There are other imported seeds that contain high proteins but are quite expensive. It is probably better to look at what is already available with us.

Soya has been used for oil for decades in India and now the high protein granules and chunks (badi) are available. The cost is slightly more than pulses but they have over twice the protein content. This is ideal for using with pulses.

Some time ago, as one friend told me, attempts were made to prepare dal-like extrudate from soya flour and this was mixed with the normal dal just like the fortified rice kernels are prepared and mixed with regular rice. It did not make any difference visually or in eating quality. The protein content however increased substantially without much increase in cost.

Similar thing would also be possible if we attempted to make groundnut granules from the defatted groundnuts after removing oil. The cost is similar to soya granules and has about 50% protein, same as soya granules. This also may work well when extruded to supplement pulses or added to atta to make roti.

There are some excellent protein isolates available for products that need such purity. They could be used in beverage mixes and other formulated products. Their cost can be justified in such products, however, for simple fortification for common people who do not have such financial resources simpler and less expensive solutions are necessary.

There is also plenty of milk produced in India and casein is also available although at higher price. However, it can help elevate the protein quality of cereals and pulses.

Some developmental work was done in some of the universities and national laboratories with improving the quantity and quality of proteins in common foods and products. However, with the appearance of superior quality proteins although at higher prices were available. Better products were produced at higher costs and market was available absorb all these.

It is time to look for alternative solutions for those who were left out and are still are protein deficient, it is necessary to think of affordable solutions. It is possible to use all the resources available to make this deficiency go away.

Prof Jagadish Pai,
Editor, PFNDAI

Alan's

BUGLES™

READY TO EAT
SAVOURY SNACK

CRUNCH KA SHOR MACHAO
BOREDOM KI BAJAO

THREE IRRESISTIBLE FLAVOURS.
ONE AWESOME SNACK.

Also try
Alan's Potato Chips

Images shown for representation purpose only.

^MRP ₹10 for 16 g Alan's Bugles.

**Brand Bugles launched for the first time in India.

SUGAR - FROM A CELEBRITY TO A VILLAIN

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

This has been the story of sugar during our lifetime. Across the world and in India sugar either as stand-alone food or as an ingredient in a range of foods has been almost always associated with pleasure, celebration, sharing, joy, partying, success etc etc.

Unfortunately over the years with changing lifestyles and probably over indulgence this happy times entity has become almost a toxic substance or a poison. Sugar is by nature a carbohydrate or macronutrient but a highly refined one with both glucose and fructose in its molecular structure and it joins other refined carbs like refined flour, polished rice and so on as the creators of the obesity pandemic. They are readily digested and rapidly enter the body as glucose or fructose.

Fructose goes straight to the liver and glucose follows the Insulin Glucagon metabolic pathway. WHO recommended that free sugars should not exceed 10% of the total daily calorie intake with a long term goal of limiting it further to just 5% of the total calorie intake. This works out to a maximum of 25 to 50 grams from all sources or 5 to 10 teaspoons per day. With most consumers of tea in India using on an average about 2 teaspoons per cup of tea and consuming at least 3 cups in a day, approximately 30 grams of sugar will be consumed through this beverage alone. Carbonated and other sweetened beverages, jams, biscuits, sweets and sweet dishes from home or outside, pastries etc makes it practically very difficult to stay within the recommended quantity.

Industry and consumers are both looking at alternatives. Other than non-nutritive sweeteners there are none. Jaggery, Honey, Palm sugar, Syrups like high fructose Corn syrup, Maple syrup ,Fruit concentrates all have sucrose as well as fructose alone and have no metabolic advantage. Some are making claims about the nutritional advantage present in jaggery like iron and other minerals, fibre etc but with the total sugar content in jaggery being not less than 90% of its weight (FSSAI standard) what remains is of no nutritional advantage and it's probably just a feel good factor.

Jaggery has 60 to 85% sucrose and up to 15% glucose and fructose ,about 8 milligrams of calcium 4 milligrams of phosphorus, 11.4 milligrams of iron which is a contaminant iron that enters into the jaggery during processing and is not bioavailable.

Total sugars in honey could be as high as 75 grams per 100 grams and is largely made up of fructose. If one were to substitute weight for weight either jaggery or honey instead of sugar the metabolic advantages are not significant, actually non-existent and largely misleading to the consumer. Even if there were to be other benefits in honey if quantity consumed were to be small or within the WHO recommendation for non-diabetics it may not cause much harm.

Sugars are defined by various terms that generally confuse the consumer. There are terminologies like total sugars, free sugar, just “sugars”, inherent sugar, added sugar and so on. Before we learn to read the label to help us choose the relatively less sugar option these definitions need to be understood.

Inherent sugar or natural sugar is the sugar nature has provided in the natural food for example sucrose in sugarcane itself. Added sugar refers to a processed food to which sugar or sucrose has been added. Sugar means only sucrose a combination of glucose and fructose while “sugars” means all mono and disaccharide sugars like glucose, fructose and galactose and disaccharides apart from sucrose like maltose and lactose.

Total sugars are obviously all the sugars from all sources including the added ones. The WHO has set the limit and also stated that this limit includes free sugars monosaccharides like glucose fructose and disaccharides such as sucrose added to foods and drinks either by the manufacturer, the cook, the consumer as well as sugar naturally present in substances like honey, syrups, fruit juices and fruit juice concentrates [WHO 2015]

Conclusion and way forward: The British Heart Foundation stated “Don't add sugar to your tea or coffee or any food or drink and avoid sugary snacks and beverages or stick to small portions”

We all hope that the initiative to minimise the sugar intake in addition to other forms of refined carbohydrates will help us to bring down the prevalence of non-communicable diseases in our country.

THERE IS NO PERFECT DIET ONLY WHAT A POPULATION CONSUMES

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

The Food Guide Pyramid introduced by USDA in 1992,arranged foods into six groups. The guide's instruction isto consume more servings from the lowest placed group, fewer as you go up and use sparingly fats and sugar placed at the top. The message is easy to understand.

Instead of educating the consumer, the icon itself became the centre of attention. Criticisms followed and it turned into a work in progress. In 2005 USDA replaced it with "MyPyramid", introducing a flight of steps flanking the pyramid to emphasise physical activity and rearranging food groups intovertical wedges. Servings changed to cups and ounces.

Six years later, it transformed to " MyPlate", with different-sized quadrants: fruits and vegetables taking half the plate; grains and proteins the other half. Vegetables and grain are larger. A survey showed that only 25% of adults were aware of it and less than 10% attempted to use its guidance. Although one-third US population eat some food from all groups, only about 1-3% eat the recommended number of servings. Further improvements continued.

On the notion that higher fat intake leads to higher rates of heart disease –prevailing in affluent Western societies - fats were placed at the top. Clinical studies later revealed that not all fats are bad. While saturated fat is bad, mono- and polyunsaturated fats lower cholesterol a risk factor for coronary heart disease. Mediterranean diets with 40% olive oil - a rich source of monounsaturated fat –correlated to lower rates of heart disease; however, traditional Japanese diets with fat at 25% daily energy from fish and vegetable oils did not show lower rates. There are dietary correlations within context but no population eats perfectly enough for generalizations.

Soon countries and regions adapted guidelines to suit their cultural patterns of consumption, and more versions – in design and content emerged. It makes sense to start here. The Chinese Food Guide Pagoda; The Healthy Food Palm, Saudi Arabia and the Japanese Food Guide Spinning Top are some examples. The Mediterranean Food Guide Pyramid favours goat milk products for reasons of intolerance. The Asian Food Guide Pyramid favours plant-based foods, with rice, noodles, soy and fish.

The diverse cuisines of India may require several such "thali" depictions; vegetarian, non-vegetarian or coastal cuisines. Consumers relate instantly – if not appetisingly - when their food preparations are showcased. So also telling consumers to follow serving sizes is unrealistic. The Indian version uses ambiguous terms like adequately, liberally, moderately and sparingly.

Nutrition labelling based on serving size is informative at the time of purchase, not at consumption. The Asian Food Guide Pyramid uses food frequency. Fruits, vegetables, legumes, rice, noodles, and whole grains are daily items; fish, shellfish or dairy is optional daily; sweets, eggs and poultry are weekly and meat is to be eaten monthly. After all food frequency questionnaires(FFQ) have been widely used for epidemiological purposes to assess the degree of association with chronic and non-communicable diseases. It should be good for dietary patterns of consumption too.

A good way to educate a population would be to build a pyramid on the actual consumption of a region/ community/ group using the food frequency questionnaire (FFQ). Then superimpose it with the recommended healthy shift. "My Thali" has a better chance of nutrition entering a household.

Veg DHA Omega-3 Throughout the Life Cycle

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

Vasta Biotech Pvt. Ltd.

M: +91 98416 03903

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

vasta@vastabiotech.com • www.vastabiotech.com

UNVEILING NATURE'S SWEETEST SECRET: STEVIOL GLYCOSIDES

AUTHORS

Ms Shilpa Dhar,
Scientist – Scientific affairs

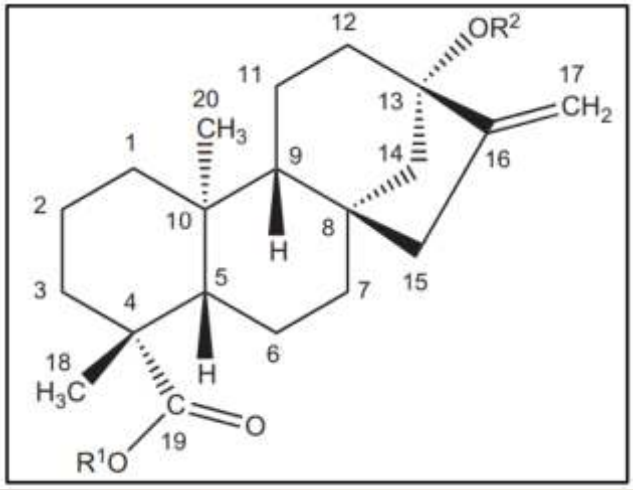
Ms Srishti Mukadam,
Trainee- Scientific affairs

R&D- Zydus Wellness

Introduction:

Stevia rebaudiana Bertoni is the sweetest variety from the genus Stevia of the Asteraceae family that produces sweet steviol glycosides. Growing throughout South America, indigenously in Paraguay and Brazil,and in many more countries including China, Kenya, Vietnam, India, Argentina, and Colombia. S. rebaudiana is a perennial shrub sometimes referred to as "Honey Leaf," "Sweet-Leaf," or "Sweet-Herb."[1,2] Stevia rebaudiana produces naturally occurring sweet-tasting ent-kaurene diterpene called steviol glycosides, which are chemical compounds of plant origin known for having distinct sweetness that is much greater than that of sucrose.[3,4] The various glycosides are called stevioside, rebaudioside A, rebaudioside B, rebaudioside C, rebaudioside D, rebaudioside E, rebaudioside F, rebaudioside M, glucoside A, rubusoside, and steviolbioside.[3,5] Approximately 200 to 300 times sweeter than sugar, stevia extract can be used as a dietary tool for lowering caloric consumption and as a great substitute for nutritive sweeteners.[2] Stevia as an intense sweetener, is commonly used to sweeten teas, medicines, food, and beverages.[6]

Figure 1: Chemical structure of steviol[4]



Steviol serves as the key element of all steviol glycosides, to which different glycoside (glucose) groups bind to produce a variety of sweet compounds in stevia (as shown in Figure 1). The glycosides pass through the upper GI tract fully intact.[7]

Microorganisms present in the colon hydrolyze steviol by cutting off their glucose units. The liver metabolizes steviol absorbed via the portal vein forming steviol glucuronide, which is excreted in the urine. Studies reveal that stevia, or any of its components or byproducts, does not accumulate in the body and gets excreted through the system as a part of metabolism. Therefore, stevia is considered a zero or no-caloric sweetener.[7]

Complan®

Zydus Wellness

63% More Protein# | 34 Vital Nutrients

2X FASTER GROWTH*

SUPPORTS MEMORY & CONCENTRATION*

₹ 30/- 75g^

ALSO AVAILABLE IN SACHETS

#Complan New Royale Chocolate contains 18g Protein/ 100g, while the leading malt-based food drink for children has 11g Protein/100g. This means that Complan has 63% more protein. (Complan New Royale Chocolate - pack July 2023, and malt-based food drink - pack July 2023). In one serving (33g) of Complan contains 5.94g protein, whereas one serving (27g) of the malt-based food drink contains 2.97g of protein. Recommended Two serve per day. *Refers to the outcome of clinical study published in Ind. J. Nutr. Dietet; (2008). ^An alternative version of Complan (apart from the regular) is available in a 75g sachet at an MRP (inclusive of all taxes) Rs. 30/- only. Super Saver Pack - Complan Royal Chocolate is also available in 400 g pouch to give saving when compared with 500g jar of the Complan Royal Chocolate. Refer pack for more details. 1.1.2 Dairy Based Beverage Mix (Proprietary Food).

Steviol and its glycosides have undergone comprehensive assessment and have been evaluated in vivo and in vitro for several parameters like acute toxicity, chronic toxicity, fertility, teratogenicity, mutation, DNA damage, etc. These assessments suggested that the compounds present in stevia are relatively safe and oral administration had no harmful effects in animals or humans.[8] All steviol glycosides share the same steviol aglycone chemical structure and undergo the same metabolic fate after consumption.[9] The Joint FAO/WHO Expert Committee on Food Additives (JECFA) established an ADI of 0–4 mg of steviol equivalents per kilogram of body weight per day for steviol glycosides. An ADI is derived from no observed adverse effect levels (NOAELs), which is the daily intake level of non-nutritive sweeteners that do not cause any adverse or biological effects.ADI is calculated by dividing the NOAEL by a safety factor (i.e., 100). This value sets ADI at a level 100 times lower than the NOAEL, establishing a wide safety margin.[10]

Regulatory status (India and globally):

Steviol glycosides are approved as a sugar substitute and a food additive in more than 130 countries by food authorities across the world, including the US FDA, EFSA, JECFA, FEMA, and FSSAI. These approvals were based on extensive research on the effects of stevia on the human body and animals.[11]

1. The Food Safety and Standards Authority of India (FSSAI) approved the use of steviol glycosides in India in 2015. High-purity steviol glycosides were sanctioned for use in various food and beverage categories including, beverages, dairy, and tabletop sweeteners.[11]

2. The US Food & Drug Administration (FDA) Steviol glycosides (high purity – 95%) are approved as GRAS (generally recognized as safe) by USFDA whereas stevia leaf or crude stevia extracts are not considered as GRAS. They are used as general-purpose sweeteners in foods.[12]

3. The Europe Food Safety Authority (EFSA) approved the use of steviol glycosides as a food additive in 2011 and marked it safe for consumption by all populations, including children and pregnant women.[11]

4. The Joint FAO/WHO Expert Committee on Food Additives (JECFA) approved steviol glycosides as safe food additives.[11]

5. The Health Canada (HC), in 2012, approved the addition of steviol glucosides to the list of permitted sweeteners in definite food categories and as a tabletop sweetener.[11]

Efficacy of stevia as a tabletop sweetener:

Several epidemiological & interventional studies have highlighted the association between sugar consumption and weight gain, which eventually increases the risk of diabetes and CVD. Replacing sugar with non-nutritive sweeteners like stevia can help reduce sugar and calorie intake.

An open label, single arm study was conducted on Indian population to evaluate the effect of sugar replacement with stevia on weight and cardio metabolic health. The study included 72 subjects between the ages of 18 to 55 yrs (inclusive), overweight subjects with body mass index (BMI) of ≥25 to ≤30.0 kg/m2, prediabetic subjects with fasting blood glucose level of 100–125 mg/dL and HbA1c levels of ≥5.7% and ≤6.4%, and subjects with normal renal and liver functions. The participants were divided into 2 groups, Group 1 consisted of overweight subjects with normal blood glucose levels and Group 2 consisted of overweight prediabetic subjects. The subjects were asked to replace added sugar with stevia in their daily diet for 90 days.[13]

BEE PHARMO LABS PVT.LTD
THE PLEDGE OF ACCURACY
SINCE 1988

OUR ACCREDITATIONS

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, vegitables 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 produts
- 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
- Natually occurring toxins(NOT,s)
- Heavy metals and minerals
- Minerals & Toxic heavy metals
- Vitamins
- Antibiotics / Residues
- Food Adulteration tests
- Food additives, preservetives and artificial sweetners
- Synthetic food colour
- Antioxidents
- Packaged Drinking analysis as per IS 14543
- Drinking water as per IS 10500
- Process water IS 4251
- Shelf life study(Ambient @ Acclerated)
- Microbiological testing (Bacterial and pathogens)
- Hygiene audit /Kitchen audit
- Allergens
- Sterol Composition

Analytical Facility

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

At day 90, in comparison to baseline, there was a significant mean reduction in weight of 1.63 kg ($p<0.001$) & 1.34 kg ($p<0.001$), and 1.49 inches ($p<0.001$), and 0.75 inches ($p<0.05$) of waist circumference in Group 1 & Group 2 respectively. 13

Group 2 did not show a significant reduction in PPBG (post-prandial blood glucose) levels while Group 1 showed a statistically significant reduction at Day 30 & Day 60 ($P<0.05$) however no change at 90 days compared to baseline. There were no evident changes observed in HbA1c (3 months glycemic control); hence, it can be concluded that stevia-based sweetener caused no effect on the levels. In both groups, change in Lipid profile as compared to baseline was non-significant.13
The estimated daily intake of steviol glycosides was 2.39 mg/kg body weight/day and 2.4 mg/kg body weight/day in Group 1 and Group 2, respectively, which was less and within the acceptable daily intake of 4 mg/kg body weight/day. No adverse effects were reported in the study.13

The study concluded that replacing added sugar with stevia in overweight and prediabetic subjects can lead to weight loss and a reduction in waist circumference when combined with a balanced diet and physical activity.13

Conclusion

Steviol glycosides have undergone a thorough safety assessment and are safe for use in all populations. Replacing sugar with Stevia (steviol glycosides) provides the same sweetness as sugar and can help ensure diet compliance. As a sugar substitute, it can help reduce calories coming from table sugar and overall sugar consumption.

References

1. Ashwell M. Stevia, Nature's Zero-Calorie Sustainable Sweetener: A New Player in the Fight Against Obesity. Nutr Today. 2015 May;50(3):129-134. doi: 10.1097/NT.0000000000000094 . Epub 2015 May 14. PMID: 27471327; PMCID: PMC4890837.

2. Peteliuk V, Rybchuk L, Bayliak M, Storey KB, Lushchak O. Natural sweetener Stevia rebaudiana: Functionalities, health benefits and potential risks. EXCLI J. 2021 Sep 22;20:1412-1430. doi: 10.17179/excli2021-4211. PMID: 34803554; PMCID: PMC8600158.

3. Singh DP, Kumari M, Prakash HG, et al. Phytochemical and pharmacological importance of stevia: A calorie-free natural sweetener. Sugar Tech. 2019;21(2):227–34.

4. Gerwig GJ, te Poele EM, Dijkhuizen L, et al. Chapter One - Stevia Glycosides: Chemical and enzymatic modifications of their carbohydrate moieties to improve the sweet-tasting quality. In: Baker DC, editor. Advances in Carbohydrate Chemistry and Biochemistry [Internet]. Academic Press; 2016 [cited 2022 May 17]. p. 1–72.

5. The authoritative voice for the stevia industry [Internet]. [cited 2020 Aug 7]. Available from: http://www.internationalstevia council.org/index.php?id=30.

6. Naik, V., & Poyil, T. (2022). Application of stevia (Stevia rebaudiana Bertoni.) in food products. Pharma Innov, 11, 2056-2060.

7. Gardana C, Simonetti P, Canzi E, Zanchi R, Pietta P. Metabolism of stevioside and rebaudioside A from Stevia rebaudiana extracts by human microflora. J Agric Food Chem. 2003; 51(22): 6618– 6622.

8. Mathur, Shaifali & Bulchandani, Neha & Parihar, Suman & Shekhawat, Gyan S.. (2017). Critical Review on Steviol Glycosides: Pharmacological, Toxicological and Therapeutic Aspects of High Potency Zero Caloric Sweetener. International Journal of Pharmacology. 13. 916-928. 10.3923/ijp.2017.916.928.

9. Perrier, J. D., Mihalov, J. J., & Carlson, S. J. (2018). FDA regulatory approach to steviol glycosides. Food and Chemical Toxicology. doi:10.1016/j.fct.2018.09.062

10. Magnuson BA, Carakostas MC, Moore NH, et al. Biological fate of low-calorie sweeteners. Nutr Rev. 2016;74(11):670–89.

11. Stevia Regulations | Best Reb M stevia | Stevia FDA Approved [Internet]. [cited 2022 May 18]. Available from: https://arborealstevia.com/stevia-regulations/.

12. USFDA: Aspartame and other Sweeteners in food. Access 29th January 2023. https://www.fda.gov/food/food-additives-petitions/aspartame-and-other-sweeteners-food

13. Raghavan G, Bapna A, Mehta A, Shah A, Vyas T. Effect of Sugar Replacement with Stevia-Based Tabletop Sweetener on Weight and Cardiometabolic Health among Indian Adults. Nutrients. 2023 Apr 3;15(7):1744. doi: 10.3390/nu15071744. PMID: 37049584; PMCID: PMC10097272.

(Recreated from Paudel et al.,2021)

MULTI-SOURCE EDIBLE OILS: AN EMERGING SOLUTION FOR INDIAN COOKING (PART 1)

AUTHORS

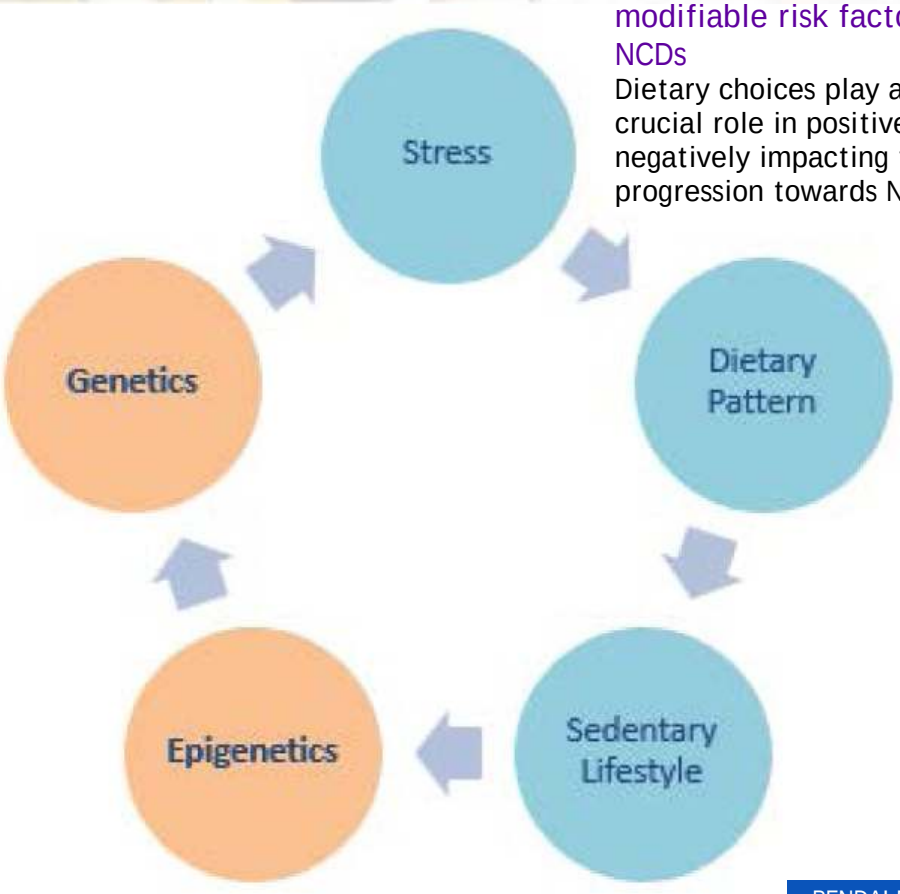
Ms Fatema Noorani, Dr Agatha Betsy,
Nutrition Science & Engagement, Marico Limited

The increasing burden of Malnutrition in India

India is facing the triple burden of malnutrition with incidences of stunting and wasting due to food shortage among the young children (2-5y) at one end and the increasing incidences of micronutrients deficiencies like iron deficiency anaemia, zinc and vitamin A and vitamin D deficiencies. Along with undernutrition, we are also facing increasing prevalence of overweight and obesity among younger and older children(CNNS, 2018).The disease epidemiology in India has transitioned within the past 2 decades from infectious diseases, undernutrition, maternal and childhood diseases to the increasing burden of noncommunicable diseases (NCDs) like cardiovascular diseases (CVD), diabetes, cancer, respiratory disorders etc. NCDs contributed to about 65% of all deaths in India and CVDs are the leading cause of the deaths by NCDs where the mortality rate due to them was approx. 26 lakhs.(WHO, 2019; Budreviciute. et. al 2020).

Stress, Physical Activity and Dietary choices are modifiable risk factors of NCDs

Dietary choices play a crucial role in positively or negatively impacting the progression towards NCDs.



Ref: Budreviciute. et. al 2020

Saffola

SAFFOLA GOLD

YOUR ROZ KA HEALTHY STEP!

Ref: My Plate for the Day, ICMR-NIN, 2020

The Fat Dichotomy

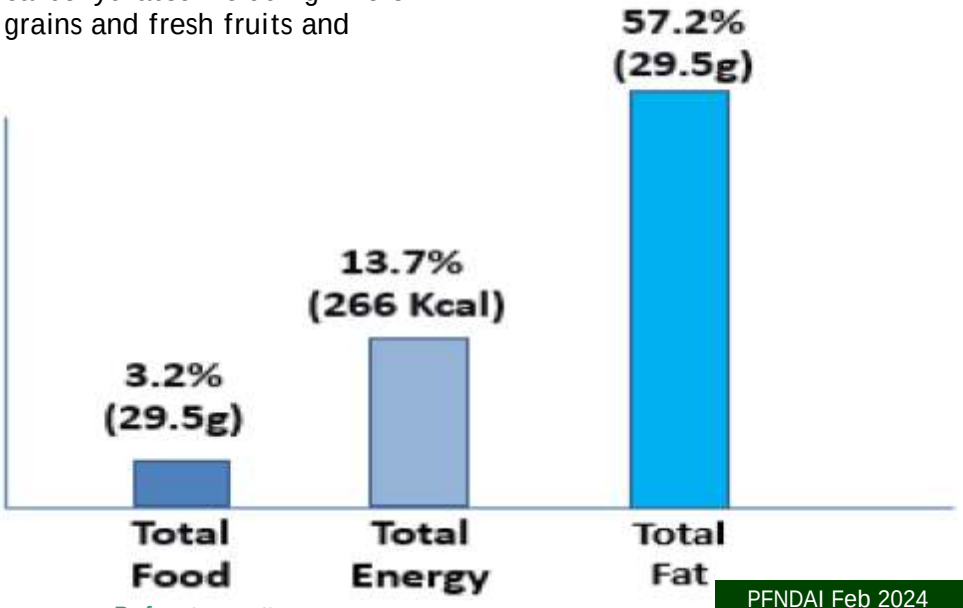
While fats have long been demonized for their association with increased prevalence of NCDs, they are an integral part of our diet, and play important functional roles in the body as well as the food. They are not only essential constituents of cells, but also form concentrated energy resources, help manage thermal regulation and act as shock absorber. In the food, they function by increasing the palatability, feeling of satiation, and act as carriers of fat-soluble vitamins.

Recommendations on Fat Consumption

As mentioned earlier, fat is recognized as a key nutrient in the body, and this is by national and international health organizations such as WHO, ICMR, FDA.ICMR -NIN recommends that a balanced diet should provide 50-55% energy (%e) from carbohydrates, of which about half should be from complex carbohydrates including whole grains and fresh fruits and vegetables and foods providing both, soluble and insoluble fibre in adequate amounts. 10-15%e should be supplied from protein preferably, high-quality protein like eggs, dairy, dairy products, and soya. Plant protein quality can be improved by combining various cereal & pulses to get required essential amino acids (EAAs). A balanced diet should also provide 15-30%e from visible and invisible fats. Moderate consumption of 27g of fats/oils a day is recommended in a Balanced Diet.

The What India Eats (ICMR-NIN, 2020) report indicates that both urban & rural Indian diets are below the recommended total fat intake. In the urban region the fat consumption is more than rural. There is an evidenced imbalance of food group intakes in Indian diet. However, with the increasing intakes of ultra-processed foods, it is proposed to be reaching the daily limits soon.

Contribution of intakes of Edible fats and oils to daily Foods, Energy and Fat intakes



Ref: What India Eats, ICMR-NIN, 2020

Types of Edible oils consumed in India

In India, soybean, rapeseed & mustard, groundnut, sunflower, safflower & niger are the *primary sources* and oil palm, coconut, rice bran, cotton seeds & tree-borne oilseeds are the *secondary sources* of production of edible oil in India. Out of total edible oils produced in the country around 68% is from *primary sources* and remaining 32% from *secondary sources*. We depend on local cultivation and import of oils to fulfil the national demands. Over a period of last couple of years, the domestic production of oil seeds has increased, and the imports have reduced majorly due to the pandemic impact.

Composition of Fats and Oils

Major components of fats are triglycerides, constituting about 95-97%. Fats are also made of saturated (single bond) fatty acids (SFA), and unsaturated (double bond) fatty acids as monounsaturated (MUFA) and polyunsaturated fatty acids (PUFA). Alpha linolenic acid (ALA), docosahexaenoic acid (DHA), eicosapentaenoic acid (EPA) are the essential polyunsaturated fatty acids that need to be derived externally, from the diet. They are associated with positive impacts on blood cholesterol levels. Apart from the fatty acids, fats also have non triglyceride moieties as phospholipids, sterols, vitamins, antioxidants etc., some of which are beneficial components.

Different fatty acids have different impacts on various health parameters. The ICMR-NIN (2020) guidelines recommend consumption of about 15-30% e from fats, of which, the quality of fatty acids should be adequately balanced to increase the consumption of MUFAs and PUFAs and reduce that of saturated fat below10% e. The intake of PUFA should be 8-10%e and MUFA can be consumed by difference. Trans fatty acids should be avoided as much as possible with not more than 1%e. A ratio of 1:1.5:1 is also recommended for SFA:MUFA:PUFA. It is also recommended to replace SFA with unsaturated fatty acids. Increased intake of PUFAs and MUFAs is evidenced to be beneficial for heart health.

However, SFA stay better at ambient temperatures but have long been associated with increasing LDL-C and TC:HDL ratio, in-turn the risk of heart diseases. Whereas, unsaturated fatty acids, PUFA and MUFA are beneficial for health but more prone to oxidative degradation. Hence, different fatty acids have their advantages and disadvantages.

Fatty Acid Composition of Single Seed Oils:

Single seed oils have a marked difference in their fatty acids composition and none of them provide the recommended ratio of balanced MUFA and PUFA. Hence, blending of different oils can improve the fatty acids balance bringing the fat profile or fatty acids ratio closer to the recommended amounts.

OILS	SFA %	MUFA %	PUFA %	RATIO		
Coconut Oil	90.9	7.2	1.9	12.6	1.0	0.3
Palmolein Oil	45	43.5	11.5	1.0	1.0	0.3
Cottonseed Oil	28.2	19.7	52.2	1.4	1.0	2.6
Sesame Oil	16.3	41.4	42.3	0.5	1.0	1.5
Rice Bran Oil	23.8	44.1	32.1	0.5	1.0	0.7
Safflower Oil (High Oleic)	7.8	77.6	15.1	0.1	1.0	0.2
Safflower Oil (High Linoleic)	9.2	14	76.8	0.65	1.0	5.4
Olive Oil	19.4	68.2	18	0.3	1.0	0.3
Groundnut Oil	10.7	71.1	18.2	0.15	1.0	0.25
Mustard Oil	5.7	67.1	27.2	0.1	1.0	0.4
Canola Oil	7	58	35	0.1	1.0	0.6
Sunflower Oil	11.4	26	62.7	0.4	1.0	2.4
Flaxseed Oil	9.6	22	68	0.4	1.0	3.0
Soyabean Oil	15.9	24.1	60	0.7	1.0	2.5
Corn Oil	16.6	33.7	49.7	0.5	1.0	1.5

Ref: Indian Food Composition Tables, ICMR-NIN, 2017

Frying of PUFA rich oils leads to generation of several undesirable components The oxidative potential varies for the fatty acids in the order of PUFA > MUFA > SFA. Exposure of edible oils to atmospheric oxygen, moisture, and steam at elevated temperatures (typically 100-125ºC, sometimes even upto 150ºC) during frying, leads to the formation of undesirable compounds due to hydrolysis, oxidation, polymerization and lipid decomposition. As the frying continues, the FFA increase the thermal oxidation releasing free radicals. Extended frying increases the FFA content to levels that lowers an oil's smoke, flash, and fire points. FFA also produce other volatile compounds or react to form non-volatile components at elevated temperatures. Oxidation and polymerization reactions are much more pronounced than hydrolytic reactions during deep-fat fryingwhere, several physical and chemical changes occur simultaneously, altering the chemical composition of edible oils during frying. Factors such as temperature, duration of heating, ratio of unsaturated to saturated fatty acids in cooking oil, type of cooking oil, presence of prooxidants and/or antioxidants are important determinants of the quality of cooking oil.

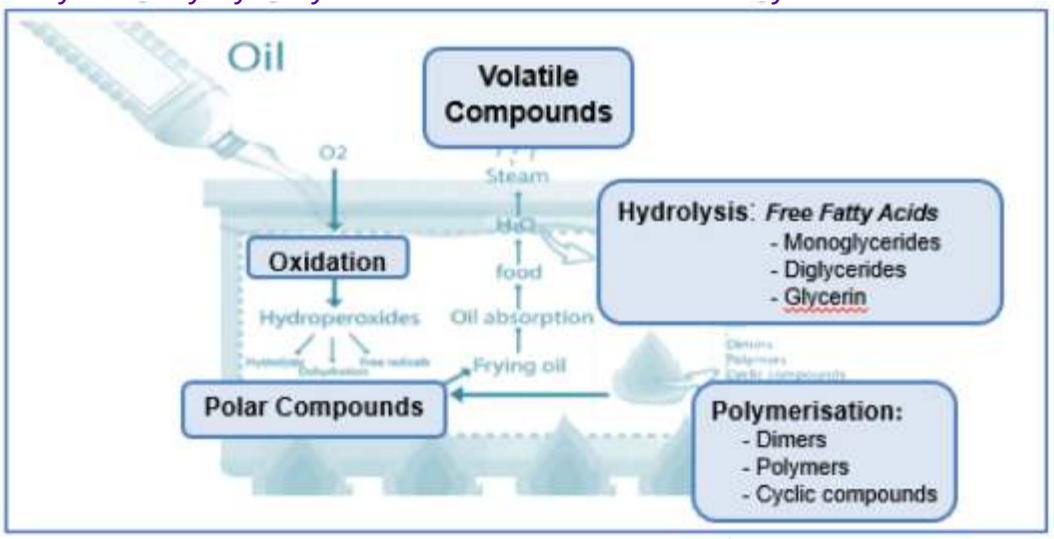
The practice of reheating the cooking oil during food preparation is very common in India both at commercial and household levels. When the oil is heated to high temperatures and is used repeatedly, physical reactions such as formation of foam, darkening of oil colour, increased viscosity and production of off-flavour in oil occur. Extensively fried and used oils become unacceptable in taste, diminished in nutritive value and,when the levels of polar compounds in such oils reach to about 20-28%, they become toxic and should be discarded.

www.tayyarijeetki.in

VITAMIN D KI TAAKAT

2 serves of Bournvita provides 50% RDA of Vitamin D (helps maintain bone, muscle & immune health) for children (7-9 yrs.), ICMR-NIN, 2020. Bournvita also contains Vitamin C, Iron, Zinc, Calcium, and other important nutrients that support bone, muscle, cognitive and immune function thus supporting strength. Refer pack for details.

Continuous Frying at higher temperature leads to formation of free fatty acids by hydrolysis and further free radicals by oxidation



Ref: Zhagi et al. 2019.

The practice of reheating the cooking oil during food preparation is very common in India both at commercial and household levels. When the oil is heated to high temperatures and is used repeatedly, physical reactions such as formation of foam, darkening of oil colour, increased viscosity and production of off-flavour in oil occur. Extensively fried and used oils become unacceptable in taste, diminished in nutritive value and,when the levels of polar compounds in such oils reach to about 20-28%, they become toxic and should be discarded.

References

1. Budreviciute A, Damiati S, Sabir DK, Onder K et al. Management and Prevention Strategies for Non-communicable Diseases (NCDs) and Their Risk Factors. Front. Public Health. 2020.8:574111. (doi: 10.3389/fpubh.2020.574111)

2. Indian Food Composition Tables. National Institute of Nutrition. ICMR. 2017.

3. My Plate for the Day. ICMR National Institute of Nutrition, 2020. Available at https://www.nin.res.in/downloads/My_plate_for_the_day.pdf.

4. What India Eats. ICMR - National Institute of Nutrition. Department of Health Research Ministry of Health and Family Welfare. Govt. of India. Telangana State. India.

5. World Health Organization. 2019; WHO reveals leading causes of death and disability worldwide: 2000-2019. (https://www.who.int/news/item/09-12-2020-who-reveals-leading-causes-of-death-and-disability-worldwide-2000-2019#:~:text=The%20number%20of%20deaths%20from,the%20WHO%20Western%20Pacific%20region.

6. Zhagi AN, Barbalho SM, Guiguer EL, Otoboni AM. Frying Process: From Conventional to Air Frying Technology. Food Reviews International. 2019. 35 (2): 1-15.

ENHANCING TEXTURE, TASTE, AND SHELF LIFE: THE IMPORTANT ROLE OF EMULSIFIERS IN BAKERY PRODUCTS

AUTHOR
Ms. Samreen Shaikh,
Jr. Food Technologist,
PFNDAI

Do you love mayonnaise? It's one of the most loving dips with a sandwich, burger, french fries, shawarma, rolls, wraps, etc. also to add flavour and texture to the pasta, as a salad dressing, etc. However, this yummy sauce is made by emulsion, i.e. by mixing egg yolk, oil, salt, vinegar/lemon juice. In this, the egg acts as a natural emulsifier as it contains a protein called lecithin which acts as an emulsifying agent. Emulsifiers are present in a wide variety of processed foods, such as meats, ice cream, salad dressings, chocolate, peanut butter, breads, baked goods, crackers, cookies, etc.

What are Emulsifiers?

Emulsifiers are substances that enable typically immiscible liquids like water and oil to combine to create a stable combination. A mixing of two or more typically immiscible liquids is called an emulsion. Emulsions are an important component of the structures and structure-forming units found in food. They are well recognized for giving food the desired mouthfeel, but they also play a crucial role in the creation of structures in some items, such as whipped toppings and ice creams, and more complicated products, like processed cheeses. Naturally occurring proteins like egg or casein in milk were the first emulsifiers. Technology developments in both chemistry and engineering have significantly increased the variety of emulsifiers available (1).

How do Emulsifiers Work?

Simple emulsions are made up of water droplets suspended in oil (w/o) or oil droplets suspended in an aqueous phase (o/w). Emulsions are thermodynamically unstable, even though they can be created quite quickly by whisking or shaking two immiscible liquids. Emulsions separate into original immiscible liquids in the absence of an emulsifier. Emulsifiers perform two important roles i.e. formation and stabilization of emulsions. You can create a transient emulsion by whisking or shaking the mixture thoroughly. But without emulsifiers, this fragile emulsion disintegrates quickly (2).Since water is polar and oil is non-polar, just adding oil to water does not create an emulsion. On the other hand, an emulsion is formed when the water and oil are whisked together. Shaking, for instance, causes the oil phase of an oil/water emulsion to separate into droplets that are then distributed throughout the water phase.

Emulsifiers prevent droplets from clumping together by creating physical barriers. They are crucial for the

production of food items because they improve their texture, flavour, appearance, and shelf life. These days, an emulsifier is added to a lot of the foods we eat, including mayonnaise, margarine, creamy sauces, candies, processed foods, confections, and a wide variety of baked goods.

Classification of Emulsifiers

Food emulsifiers can be classified according to a number of characteristics, such as natural or synthetic, soluble or non-soluble, functional group presence, hydrophilic/lipophilic balance, etc.

There are various types of emulsifiers used by the food processing industry. Natural emulsifiers include substances like lecithin obtained from eggs, soy, etc., carrageenan from red seaweed, guar gum, xanthan gum, etc. Although lecithin can be obtained naturally, it can also be prepared synthetically. Synthetic emulsifiers include DATEM (diacetyl tartaric acid ester of mono and diglycerides), PGE (Polyglycerol esters of edible fatty acids), Mono and diglycerides, etc.

DATEM is the most widely used emulsifier in various bakery products like bread, cakes, biscuits and cookies, whipped toppings, sauces and dressings, ice cream, etc (3). DATEM is made by, acetic anhydride and tartaric acid, a by-product of winemaking, reacting to acetylate the two hydroxyl groups in tartaric acid, turning it into an anhydride. Monoglyceride is then used to react with this (4). It is commonly used as a dough conditioner which strengthens the gluten network in dough while baking.

PGE is used in food as an emulsifier. It is an oily to hard waxy substance with a colour ranging from white to off-white. It dissolves in oils and is dispersible in water (5). It is mostly used for softening cake-based products. Used widely in cake batters, whipping toppings, margarine, etc. The addition of PGE can improve the functional properties of margarine. It is also used to make whipped toppings, it improves foam stabilization and aeration.

Food emulsifiers and their uses (6)

Emulsifier	Food products
Mono- and diglycerides	Bread, cake, pasta, frozen dessert, icing, topping, peanut butter, margarine, dehydrated potatoes, shortening, coffee whitener, and pasta
Glycerol monolaurate	Bread, whipped topping, frosting, glaze, and cheese products
Ethoxylated monoglyceride	Bread, whipped topping, icing, frozen dessert, and coffee whitener
Diacetyl tartaric acid esters of monoglyceride	Bread, extruded products, icing, margarine, and salad dressing
Succinylated monoglyceride	Bread
Calcium stearoyl-2-lactylate	Bread, egg whites, and dehydrated potatoes
Sodium stearoyl-2-lactylate	Bread, pasta, dehydrated potatoes, and coffee whitener
Propylene glycol esters	Cake, whipped topping, dehydrated potatoes, and shortening
Sorbitan esters	Whipped topping, cake, cake mix, cocoa, icing, filling, and coffee whitener
Polysorbate 60	Whipped topping, cake, cake mix, cocoa, icing, filling, coffee whitener, shortening, salad dressing, and edible oil
Polysorbate 65	Ice cream, frozen custard, ice milk, sherbet, frozen dessert, icing, cake, cake mix, whipped topping, filling, and coffee whitener
Polysorbate 80	Ice cream, frozen custard, ice milk, sherbet, frozen dessert, gelatin mix, shortening, baked goods, bakery mixes, filling, icing, topping, and frying oil
Sucrose esters	Bread, bakery mixes, frozen desserts, whipped milk products, and ice cream
Lecithin	Baked goods, chocolate, cooking spray, instant foods, and margarine

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

FINE specialty additives for oil binding applications

FINE ORGANICS

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.

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

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

Email: food@fineorganics.com | Web: www.finorganics.com

Functions & Benefits of Emulsifiers in Food:

The main function of emulsifiers is to stop the separation of their oil and water components. Emulsifiers are added to processed foods such as mayonnaise, ice cream, chocolates, peanut butter, cookies, creamy sauces, margarine, and baked goods. These foods have a smoother texture and a longer shelf life, thanks to emulsifiers. Some of the functions of food emulsifiers include emulsification, whip ability, surfactant, de-foaming agent, humectant, etc.

DATEM (diacetyl tartaric acid ester of mono- and diglycerides) is the most popular and widely used food additive. It is used in the food and beverage industry. It is used mostly as a dough conditioner for baked products, especially yeast-leavened products, breads, cakes, etc. This emulsifier works as a dough strengthener due to its ability to interact with gluten, which helps in forming a network that gives stability to the dough and helps in gas retention. DATEM is used in a variety of baked goods applications, from generating magnificent baked goods with the appropriate textural qualities to standardising the quality of flour. It offers enormous advantages and is widely used in bakeries (7).

Other than emulsification, emulsifiers perform many other important functions in food products like aeration, dough conditioners, crumb softeners, increased shelf life, gas retention, etc. For example, in a cake emulsion, using an emulsifier blend allows for high-volume aeration, foam stabilisation, softness, and moisture retention. The commonly used emulsifiers in the food industry include lecithin, carrageenan, guar gum, xanthan gum, polysorbates, mono and diglycerides, etc. Lecithin is derived from eggs, soybeans, etc. It is one of the most common and widely used emulsifiers in the food industry. As an emulsifier, lecithin is frequently used to enhance the texture and shelf life of food products.

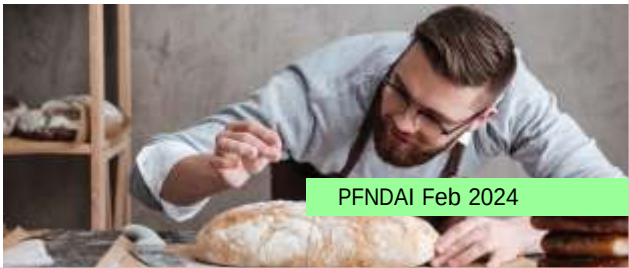
Cakes are complex mixtures made mostly of water and oil-based substances that naturally create incompatible foams of water and air. The most typical instances of incompatible components are milk, butter, and water. Emulsifiers facilitate the faster blending and stable emulsion development of these substances by reducing their surface tension. Appropriate emulsification contributes to enhanced sensory qualities by enhancing the cake's structure and texture. Emulsifiers also aid in increasing the amount of air in the batter and enhancing aeration, which produces a lighter, fluffier cake that rises more evenly and doesn't collapse in on itself. Emulsifiers also have the added benefit of prolonging the shelf life of baked goods by delaying the staling process.

Safety and Regulations:

In India, FSSAI gives a list of permissible emulsifiers in Appendix A for the list of food additives (8).
As with any other food additives, emulsifiers go through safety evaluations before being allowed to be used in food.For several approved food additive emulsifiers, acceptable daily intakes (ADIs) are calculated, which indicate the amount of the emulsifier that can be consumed daily without posing a significant health risk. The regulatory bodies set maximum permitted levels (MPLs) or maximum usage levels (MULs) as the concentrations at which food manufacturers are allowed to use additives to make sure the ADI is not exceeded (9).

Conclusion

To put it simply, an emulsifier is a material that facilitates the mixing of water and oil. Foods like mayonnaise and salad dressings, which are emulsions, require an emulsifier. Nevertheless, a lot of people are unaware that emulsifiers serve essential purposes in practically every processed item, including ice cream, confections, and bakery goods, in addition to their widely known role in mixing. "A lot of people think that emulsifiers are only used to create emulsions of oil and water."



There are several applications for emulsifiers. These include making ice cream creamier and less prone to melting, preventing chocolate bloom, enhancing the aeration, texture, and slicing of baked goods, extending the shelf life of various meals, and lowering the fat level. Emulsifiers are extensively found in food supplies and play a major role in enhancing the texture, appearance, and shelf life of many of the foods we eat today. Emulsions have a lengthy history of use and are commonly used in a variety of everyday things (10).

Natural emulsifiers are used in a wide range of emulsion-based systems, which makes them desirable for use in several goods, especially in the food business. Foods can have their appearance, sensory qualities, and attractiveness customized by the type of emulsion that is generated (such as simple or double character, nano/micro-scale, etc.), as well as by the nature and function of the emulsifiers. Emulsions serve several purposes, but one growing application among them is as functionality carriers. Recent research has shown how versatile and prospective they are for flavour encapsulation, as well as for delivering and protecting particular bio-actives in food and drink, promoting the creation of reduced-fat goods and boosting nutritional balances (11).

References

1. Gerard L. Hasenhuettl & Richard W. Hartel, Food Emulsifiers and Their Applications, Second Edition. (https://thunderbooks.files.wordpress.com/2009/05/food-emulsifiers-and-their-applications-springer-2008.pdf)

2. Laura Cassiday, November 2016, Food Emulsifier Fundamentals. (https://www.researchgate.net/publication/309623286_Food_emulsifier_fundamentals)

3. https://foodadditives.net/emulsifiers/datem/

4. Eagan Press Handbook Series, Emulsifiers, Clyde E. Stauffer.

5. https://www.savannahgoa.com/products/polyglycerol-esters-of-edible-fatty-acids-pge-e475/#:~:text=Polyglycerol%20Esters%20of%20Edible%20Fatty%20Acids%20(PGE)%20is%20manufactured%20using,water%20and%20soluble%20in%20oils.

6. Food Emulsifiers, From: Encyclopaedia of Food and Health, 2016, (https://www.sciencedirect.com/topics/pharmacology-toxicology-and-pharmaceutical-science/food-emulsifier#:~:text=A%20food%20emulsifier%2C%20also%20called,prevent%20separation%20of%20the%20components)

7. https://nuffoodspectrum.asia/2017/06/20/the-all-rounder-bakery-emulsifier.html

8. https://fssai.gov.in/upload/uploadfiles/files/appendix_a_and_b_revised(30-12-2011).pdf

9. Food additive emulsifiers: a review of their role in foods, legislation and classifications, presence in food supply, dietary exposure, and safety assessment, Selina Cox, Alicia Sandall, Leanne Smith, Megan Rossi, and Kevin Whelan.

10. Food Emulsifier Fundaments (https://www.researchgate.net/profile/Laura-Cassiday-2/publication/309623286_Food_emulsifier_fundamentals/links/5ae0bf8d0f7e9b2859480702/Food-emulsifier-fundamentals.pdf)

11. New Trends in Natural Emulsifiers and Emulsion Technology for the Food Industry, (https://www.intechopen.com/chapters/78387)

CAFFEINE: UNLOCKING ITS HEALTH BENEFITS!

AUTHOR

Ms Merlyn Mascarenhas,
Technical Assistant, PFNDAI

Coffee is one of the most consumed beverages by individuals worldwide. It is been consumed not only for its distinct flavour and aroma but also for the health benefits it has to offer.

Sounds interesting right? We usually associate caffeine with a negative connotation but let us try and understand caffeine and the various health benefits associated with it.

Caffeine is a naturally occurring stimulant of the central nervous system which belongs to the methylxanthine class. [1] It is mainly found in coffee, and other plants like cacao beans, guarana berries, and tea leaves. It can also be added in soft drinks, energy drinks, gum, and prescription drugs.After being taken orally, caffeine is quickly absorbed by the small intestine in the human body within 45 minutes, reaching its typical peak value at 30 minutes. This time frame is directly influenced by pH, and it can be extended by eating. [2]

Role of caffeine in health:

1. Alzheimer's disease - Fifty to seventy percent of instances of neurodegenerative dementia are caused by Alzheimer's disease, which is characterized by a progressive decline in cognitive function. Studies have shown that caffeine exerts neuroprotective properties at dosages about 3-5 mg/kg body weight.Drinking three or more cups of coffee a day is linked to a reduction in verbal memory deterioration. [2]

2. Parkinson's disease – Similar, to Alzheimer's disease, Parkinson's is also a type of neurodegenerative disease associated with motor and non – motor symptoms. Caffeine is shown to reduce the risk of Parkinson's disease. Research suggests thatco-administering caffeine with Parkinson's disease medications that are currentlyin the market lowers drug tolerance and boosts the efficacy of the drug's activity. [2]

3. Caffeine and perception of pain - Because of its vasoconstricting and anti-inflammatory properties, caffeine is a common ingredient in both prescription and over-the-counter pain medicines. A higher heat pain tolerance and higher pressure pain were all linked to frequent dietary caffeine consumption. Caffeine's ability to directly affect adenosine receptors appears to be a key factor in its ability to lessen pain perception. This is particularly true when it comes to centrally blocking receptors that affect pain signalling or blocking peripheral adenosine receptors on sensory afferents. [2]

4. Liver disease - After reviewing multiple researches, the International Agency on Research on Cancer (IARC) determined that lower blood concentrations of indicators of liver damage, such as γ-glutamyl transferase and alanine aminotransferase, were correlated with greater coffee consumption.Coffee's hepatoprotective effect has been attributed to caffeine as well as other bioactive substances like trigonelline and chlorogenic acids. [3]

5. Antioxidant and anti – inflammatory properties - It has been shown that caffeine effectively scavenges hydroxyl radicals.In rats, caffeine consumption has also been linked to higher glutathione

MODERN DAIRIES®
taste happiness™

NutriLac®
NUTRITIONAL INGREDIENTS

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

Abbott A Promise for Life
CADILA PHARMACEUTICALS LIMITED
Amway
Zydus Wellness
FDC Limited
Raptakos, Brett & Co. Ltd.
Coca-Cola
Hindustan Unilever Limited
BRITANNIA Eat Healthy. Think Better
Pizza Hut
Domino's Pizza
WRIGLEY A Subsidiary of Mars, Incorporated

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

and possesses lipolytic and thermo-genic properties, all of which are beneficial for weight management.[2]

7. Urinary tract - Caffeine's well-known diuretic impact is connected to the preservation of water-salt balance in various segments of the nephron, where adenosine plays a complex function dependent on the varied expression of its receptors. It raises the rate of glomerular filtration, which is counteracted by adenosine-mediated vasoconstriction of renal afferent arterioles during tubule glomerular feedback.It has been shown to increase urine output, but excessive caffeine use (more than 400 mg/day) has been linked to an increased risk of detrusor instability (unstable bladder) in women. [2]

8. Glycaemia - Caffeine at high dosages increases glucose tolerance while decreasing insulin sensitivity. It has been demonstrated that decaffeinated coffee, as opposed to caffeinated coffee, lowers HbA1c levels used in glycaemic monitoring, implying that coffee includes additional compounds that may benefit glucose metabolism, which has to be investigated. [2]

9. Digestive tract cancer - Caffeine may lower the risk of digestive tract cancer, particularly liver cancer and colon cancer. In vitro investigations with human gastric cancer cells revealed that caffeine treatment inhibited gastric cancer cell growth and survival while activating the caspade-9/-3 pathway, which triggered cell death.Caffeine may be effective as a long-term anticancer drug in the treatment of stomach cancer, however further research is needed to corroborate these findings. [2]

10. Respiratory system - Caffeine (3 mg/kg body weight) acute consumption may improve peak aerobic performance and increase peak lung ventilation. Caffeine's function in this action could be explained by its ability to influence respiratory muscle. On consumption of 600 mg caffeine it was found that it raised trans-diaphragmatic pressure, most likely by increasing muscle contractility.This shows that caffeine could be utilized to treat patients who have respiratory muscle dysfunction. [2]

Now after having looked at the amazing health benefits of caffeine. It's time to compare the caffeine content between the two most debateable beverages coffee and tea so as to help one make an informed and wise choice.
The amount of caffeine in tea or coffee varies greatly depending on its origin, type, and preparation.Tea leaves contain 3.5% caffeine, while coffee beans have 1.1–2.2%.The coffee brewing technique, employs hotter water, at a temperature of 195-205°F (90-96°C) being optimum which extracts more caffeine from the beans. To prepare either tea/coffee, an individual typically uses more coffee beans than tea leaves. Hence, a brewed coffee would have more caffeine than tea. [4]

The leaves of the plant, Camellia sinensis, are used to make black, green, and white teas. The distinguishing factor is the time of harvest and the extent of oxidation of the leaves.White and green tea leaves are not oxidized, however black tea leaves are. This imparts a distinctive powerful flavour to black tea and boosts the extent to which caffeine from the leaves penetrates into the hot water. [4]

A typical cup of black tea contains 47 mg of caffeine, although it can have up to 90 mg. Green teas have 20-45 mg, whereas white teas contain 6-60 mg per cup.Caffeine content in an 8-ounce cup of coffee is 95 mg. [4]

Pouring hot or boiling water over ground coffee beans, generally contained in a filter, produces brewed coffee. Caffeine levels in one cup of brewed coffee range between 70 and 140 mg. Espresso is created by passing finely ground coffee beans through a little amount of hot water, or steam. Although espresso has more caffeine per volume than normal coffee, it usually has less caffeine per serving because espresso cups are small. One shot of espresso is approximately 30-50 mL and contains approximately 63 mg of caffeine. Instant coffee is created from freeze-dried or spray-dried brewed coffee. It is usually in huge, dry chunks that dissolve in water. Caffeine content in instant coffee is often lower than that of normal coffee, with one cup containing approximately 30-90 mg. Decaf coffee although the term may be misleading, but it may contain caffeine. Caffeine content can range from 0 to 7 mg per cup, with the average cup holding 3 mg. [5]
Caffeine may be present in soft drinks such as sodas and fruit-flavoured beverages. For example, a 12-oz can of cola has around 21 mg of caffeine. [6]

Energy drinks are frequently loaded with caffeine and sugar. Caffeine can be derived from natural sources such as guarana leaves. Caffeine levels in energy drinks vary greatly between brands. As an example: One 8.4-ounce can of Red Bull energy drink has 74.8 mg of caffeine. [6]
Caffeine levels in dark chocolate are higher than in lighter or milk chocolate. For example, the caffeine content of a 1-oz serving of chocolate is:70–85%cacao solids contains 22.7 mg caffeine.[6]

So, to conclude the benefits of caffeine can be enjoyed by individuals if consumed in moderation. The vulnerable population consisting of children, pregnant and lactating women, also those dealing with various ailments such as heart disease, GERD, migraines or either are on certain medications need to be careful. [5]

References:

1) Evans J, Richards JR, Battisti AS. Caffeine. 2023 Jun 8. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan–. PMID: 30137774. https://pubmed.ncbi.nlm.nih.gov/30137774/

2) Rodak K, Kokot I, Kratz EM. Caffeine as a Factor Influencing the Functioning of the Human Body—Friend or Foe? Nutrients. 2021; 13(9):3088. https://doi.org/10.3390/nu13093088

3) dePaula J, Farah A. Caffeine Consumption through Coffee: Content in the Beverage, Metabolism, Health Benefits and Risks. Beverages. 2019; 5(2):37. https://doi.org/10.3390/beverages5020037

4) Medically reviewed by Adda Bjarnadottir, MS, RDN (Ice) — By Lisa Wartenberg, MFA, RD, LD — Updated on February 3, 2023 https://www.healthline.com/nutrition/caffeine-in-tea-vs-coffee#caffeine-concerns

5) By Adda Bjarnadottir, MS, RDN (Ice) — Updated on February 7, 2023 https://www.healthline.com/nutrition/how-much-caffeine-in-coffee#TOC_TITLE_HDR_3

6)Medically reviewed by Marie Lorraine Johnson MS, RD, CPT — By Jamie Eske — Updated on March 23, 2023 https://www.medicalnewstoday.com/articles/324986#other-sources-of-caffeine

FROM HARVEST TO HEALING UNVEILING THE JOURNEY OF GINGER

AUTHORS

Ms Simran Vichare,
Nutritionist, PFNDAI

Ms Merlyn Mascarenhas,
Technical Assistant, PFNDAI

For centuries, ginger, a knobby rhizome with a unique aroma and a spicy bite, has been used extensively in traditional medicine and cooking especially in Asian countries like India and China. Kerala is the largest producing state in India for ginger, contributingto 33% of the overall production. (1) Ginger's diverse chemical profile supports a remarkable spectrum of health advantages that extend beyond its culinary uses. In this article, we shall dive intothe processing and a few health benefits of ginger along with exploring its chemistry.

Processing of Ginger:There are two important factors when choosing the ginger rhizomes for processing:
1. Maturity stage at the time of harvest – Ginger can be harvested as soon as the leaves start to turn yellow and dry out. This physical procedure typically is best observed seven to nine months after planting, this time frame is thought to be the normal ginger harvesting season.[1]

The time frame for harvesting ginger for various uses is indicated below (Source: FAO). For use at fresh: five months 5-7 months for preserved ginger; 8–9 months for dried ginger, or until the leaves begin to turn yellow.
8–9 months for the generation of essential oils

2. Native properties of the type grown – Ginger's natural qualities, including its taste, flavour, aroma, and colour, vary depending on the variety grown in each region of the world. The best rhizomes are condition medium-sized ones. Since they don't dry out well and have a high moisture content. [1]

The climate required for the processing of ginger:Ginger needs warm, humid weather. In the Himalayas, the plant grows well up to 1,500 meters above sea level, with 300 to 900 meters being the ideal elevation. Large-scale ginger farming requires well-distributed rainfall (150 to 300 cm) during the growing season and dry spells during land preparation and before harvest. (2)

ROHA®
INNOVATING FOR YOU. WITH YOU.

VIBRANT HUES FOR

BEVERAGES

SELECT FROM CLEAN LABEL AND NATURAL COLOR SOLUTION FOR YOUR DRINKS

Customized Blends | Clean Label | 100% Natural

Customized Solutions | Short Lead & Turnaround Time | End-to-end Customer Support

Color Solutions for: Still Beverages | Carbonated Soft Drinks | Juice Based Sports Drinks | Powdered Beverages

FOOD COLORS

IDACOL® ULTIMATE SYNTHETIC COLORS

NATRACOL® COLORS INSPIRED FROM NATURE

FUTURALS® NATURE AT ITS BEST

DRIED INGREDIENTS

OVEGI Dehydrated Ingredients

INDUSTRIAL COLORS

SIMPSONS® DYES & PIGMENT SPECIALISTS

T: +91 22 6819 1919 | E: contact@rohagroup.com | www.roha.com

rohaglobal

roha-simpsons

The basic steps involved in the processing of ginger are:

1. Cleaning - It is vital to clean the harvested rhizomes to get rid of the dirt, branches, and roots. During olden times, rhizomes were dipped in boiled water for 10 minutes. But nowadays, it is advised to scrub the rhizome either with a brush or by your hands in clean, sterilized water that contains 150 parts per million hypochlorous acid.[1]

2. Sorting – It is grouping based on attributes like size, shape, weight, image, and colour. Ginger that is clean, bright, and brown-yellow in colour is preferred.[1]

3. Peeling - Peeling the ginger is done before drying for faster and more effective moisture content reduction. It is called "black" or "green" ginger if it hasn't been peeled and has only been cleaned and dried; and "white" ginger if it has been peeled. Cutting down on drying time is crucial in preventing mould growth.[1]

4. Slicing - The most crucial step in the procedure is slicing the ginger root before it is dried since larger ginger roots will be more challenging to dry because of their high moisture content.[1]

5. Drying - It is the process of reducing moisture to a preset level using heat. It is necessary for ease of transportation and waste reduction. The most common and ancient method followed by Indian farmers is sun drying. [1]

According to the Indian Spice Board, the general procedure for preparing dried spices is as follows:

- Soak the rhizome overnight in water.
- Peeling/scraping with bamboo splinters having pointy ends
- One week in the sun
- Soak for another 6 hours in water containing 2% lime.
- Final drying to 8-10% moisture (not more than 12%).[1]

6. Grading and packaging - Based on the drying process, dried ginger can be classified as peeled, unpeeled, scraped, rough, bleached, splits, or sliced. Wooden crates are preferred for packaging in the domestic market. [1]

Ginger (Zingiber officinale) is a treasure trove of bioactive compounds, each playing a unique role in promoting well-being. The primary constituents include gingerol, terpenes, shogaol, paradol, zingerone, and volatile oils. These compounds are responsible for the characteristic flavor and scent of ginger, but more importantly, they are the driving force behind its therapeutic properties. There are many different ways to use ginger: raw, dried, pickled, candied, crystallized, and ground or powdered.

Capsules, tablets, tinctures, teas, and liquid extracts are also available. It seems obvious that the concentrations of the active substances (shogaols and gingerols) will vary depending on the processing procedures and types of preparations. Since the two compounds differ in their pharmacological and bioavailability, the degree to which gingerols are converted to shagaol will probably have a major impact on the therapeutic advantages. This is because gingerols are thermally labile. Besides this, let us discuss a few aids in which Ginger can play a dominant role:

Digestive aid:

For centuries, ginger has been used to alleviate digestive discomfort whether it is in the form of dried/fresh ginger or even its juice. The spice stimulates saliva production and suppresses gastric contractions, reducing symptoms of indigestion and nausea. Ginger is a valuable food ingredient that has a carminative action, eases intestinal cramps, lowers the pressure on the lower esophageal sphincter, and guards against bloating, flatulence, and dyspepsia (3). Any time of day is a good time to drink ginger tea. In addition to being a great morning pick-me-up, you might discover that it aids with digestion if had an hour after a meal.

Anti-inflammatory properties:

The main bioactive component of ginger, gingerol, is well known for having strong anti-inflammatory and antioxidant properties. Heart disease, diabetes, and certain types of cancer are among the many chronic diseases that are associated with inflammation and oxidative stress. Ginger is a useful ally in preserving general health because of its capacity to reduce inflammation and eliminate free radicals.

Anti-Nausea Properties:

Ginger is a natural treatment for motion sickness, morning sickness during pregnancy, and chemotherapy-induced nausea because of its anti-nausea qualities. Because of its effects on the gastrointestinal tract and central nervous system, ginger is a safe and useful substitute for traditional anti-nausea drugs, according to researchers. (4) Ginger and its compounds have the potential to enhance digestive responsiveness and boost stomach emptying. Additionally, the spice has anti-inflammatory qualities that can enhance digestion and promote the release of hormones that regulate blood pressure, which can help soothe the body and lessen nausea.

Pain Relief:

Ginger's anti-inflammatory properties extend to pain relief too, making it a natural remedy for conditions such as osteoarthritis and menstrual pain. Some research indicates that ginger can be as effective as non-steroidal anti-inflammatory drugs (NSAIDs) in alleviating pain, with the added benefit of fewer side effects. A study found that the trial group, which received ginger extract daily, and the placebo group without any intervention showed a significant difference in participant's duration and severity of pain (5). Additionally, salicylates present in ginger are converted by your body into salicylic acid. Salicylic acid reduces pain and discomfort by stopping your nerves from producing specific prostaglandins.

In short, ginger's chemistry tells a captivating story about a spice that exceeds its culinary applications. Ginger has a wide range of health advantages due to its bioactive ingredients; these include pain relief, digestive support, antioxidant and anti-inflammatory properties, and more. Including this versatile spice in your diet can be a delicious approach to take advantage of its healing qualities and improve your general health. Ginger can be enjoyed in a variety of ways, ranging from brewing tea to adding it to your main meal. You may flavor savory as well as sweet dishes with it.

Few products based on ginger:

1. Ginger tea – When someone at home is down with a cold, cough, or has a bad throat, a warm cup of ginger tea comes to our rescue. It is prepared by simmering chopped fresh ginger in water for at least five to ten minutes. After that, it can be served by adding lemon or honey. [1]

2. Baked products: Ginger biscuits, cookies, and cakes - One teaspoon of ginger powder can give a strong aroma and is sufficient for four cups of flour when making biscuits, cakes, and cookies. [1]

3. Ginger wine - Grapes are fermented together with the addition of ginger, sugar, and yeast to make ginger wine. Usually, 50 grams of ginger is needed to prepare one litre of wine. The flavour is at its peak after three to four months of storage. It can be consumed on its own or after mixing with any add-on. [1]

4. Ginger juice - Fresh raw ginger is chosen and well-cleaned with water. The juice is extracted using a blender, and it is filtered using a cloth and a hand press. Following the extraction of the juice, they were measured in a 1.22:1 water: sugar ratio; and sugar, water, and citric acid syrup was prepared.

After boiling the juice at 80 to 90°C, KMS (Potassium metabisulphite) was added, and it was bottled. [6] This juice can be used for preparations of soups, salad dressings, pickles, or even cocktails.

5. Ginger oil - The two basic techniques for extracting oil from ginger are solvent extraction and steam distillation. However, the steam distillation technique is primarily employed in this procedure. Ginger's epidermal tissue contains oil, and the oil's smell is caused by the presence of essential oils, which have flavour and aroma. Ginger oil is a flavouring used in pharmaceuticals, food processing, and perfumery. [1]

6. Ginger paste - Chop some fresh ginger and process the pieces into a thick paste. To the paste, add vegetable oil (60 ml per kg of paste). Cook, stirring constantly, for five minutes. Following that, the ginger paste is put into a sterilized jar with a 5 to 10-mm headspace. Make sure to brush the paste's surface with one teaspoon of warm oil before sealing. After that, the packed ginger paste needs to be pasteurized for ten minutes at 85–90°C. Lastly, let the ginger paste cool, then level and store it in a cool, dry location. [1] One of the most common uses of ginger paste is for marination of meat/ fish etc, or even Asian- inspired stir fry veggies/ meat.

As we relish the deep flavor and fragrance of ginger in our food, let's also embrace the understanding that this spice not only attracts our palates but also profoundly nourishes our bodies. Incorporating this amazing rhizome into our daily lives could be the spicy key to a better, more energetic future as studies continue to unlock its secrets.

References:

1) Bag, B. B. (2018). Ginger processing in India (Zingiber officinale): A review. Int J Curr Microbiol App Sci, 7(4), 1639-1651.

2) Nybe, E. V., & Raj, N. M. (2016). Ginger production in India and other South Asian countries. In Ginger (pp. 231-260). CRC Press.

3) Nikkhah Bodagh, M., Maleki, I., &Hekmatdoost, A. (2018). Ginger in gastrointestinal disorders: A systematic review of clinical trials. Food science & nutrition, 7(1), 96–108. https://doi.org/10.1002/fsn3.807

4) S. Holtmann, A. H. Clarke, H. Scherer, and M. Hohn, “The anti-motion sickness mechanism of ginger. A comparative study with placebo and dimenhydrinate,” Acta Oto-Laryngologica, vol. 108, no. 3-4, pp. 168–174, 1989.

5) P. Rahnama, A. Montazeri, H.F. Huseini, S. Kianbakht, M. Naseri. Effect of Zingiber officinale R. rhizomes (ginger) on pain relief in primary dysmenorrhea: a placebo randomized trialBMC Compl Alternative Med, 12 (1) (2012 Dec), pp. 1-7

6) Ahammed, S., Talukdar, M. M. H., & Kamal, M. S. (2014). Processing and preservation of ginger juice. Journal of Environmental Science and Natural Resources, 7(1), 117-120.

'CULTIVATING CHANGE: EXPLORING THE FUTURE OF PLANT-BASED FOODS'

REPORT BY
Ms Merlyn Mascarenhas,
Technical Assistant, PFNDAI

Protein Foods & Nutrition Development Association of India (PFNDAI) organized a Nutrition Awareness Activity in collaboration with Karunya Institute of Technology and Sciences, Coimbatore on 19th of January 2024, at 3 pm virtually through Zoom.

An online contest was held for all the undergraduate students from the Department of Food & Nutrition of Coimbatore Colleges. They had to create innovative plant-based product ideas and present them. The theme of the contest was "Sustainable Cuisine: Embracing the Plant-Based Revolution" with a focus on innovative, healthy, and nutritious products. The students showed great enthusiasm and came out with very innovative ideas. The entries were in pairs and we received a total of about 21 pairs.

As a part of Nutrition Awareness Activity, Protein Foods & Nutrition Development Association of India (PFNDAI) also organized a webinar on "Cultivating Change: Exploring the future of plant – based foods".

The webinar began by Ms. Simran Vichare, Nutritionist, PFNDAI welcoming all the attendees and briefly introducing the speakers and sponsors for the webinar which included Prolicious, Marico, Kellogg & IFF.

It was then followed by a welcome address by our Executive director, Dr. Shashank Bhalkar. He extended a warm welcome to all present and thanked the sponsors for their financial support. He raised concerns about how food security is becoming a rising global issue and factors such as global warming, climate change, ever-increasing population, and their needs make it a sustainable option to switch to plant-based foods.

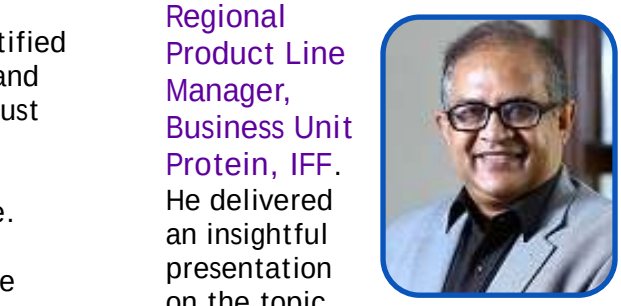
He also highlighted the importance of nutrition security which one must consider while switching to plant-based foods. He briefly discussed the benefits of the consumption of plant-based foods; also focused on the challenges and set the stage for the webinar.

Ms. Simran Vichare, Nutritionist, PFNDAI welcomed and introduced the first speaker for the webinar Ms. Nadiya Merchant, Head – Nutrition, Kellogg India.

Ms. Nadiya delivered an excellent presentation on the topic of *"Plant Protein Insights and Trends"*. She highlighted the importance of protein and the sources through which one can increase the uptake of protein in their diet. She emphasized on the major factors acting as motivators amongst individuals to eat more protein such as it supports well-being and sports performance, it builds and preserves lean muscle mass, and reduces the consumption of carbohydrates. She presented statistical data discussing the most important factor while choosing protein. Taste, type of protein, healthfulness, and price ranked amongst the highest when choosing a protein. She very well explained the Indian Plant Protein Market which is estimated at USD 0.91 Billion currently in 2024 and is expected to rise multi-fold in the future to come. The second half of the presentation focused on the rising trends in the plant-based protein market. She spoke about the emerging plant protein ingredients such as moringa and duckweed both of which are highly nutritious. She concluded by giving an insight into how individuals are looking for healthier food options fortified with plant-based protein and how the food industries must develop a New Product Development Strategy revolving around the same.

The second speaker for the webinar was Ms. Chandan Manroa, Head – Nutrition, Prolicious. She presented on the topic *"Navigating the plant-based lifestyle with high protein products"*. She spotlighted how an increase in urbanization and population has put a tremendous amount of pressure on the production of food. She showcased the statistics highlighting the surge in demand and reasons for the consumption of plant-based foods. She also focussed on the challenges faced by the food industry such as the taste, texture, lack of sweetness, and umami flavour in raw plant ingredients and low solubility of certain ingredients such as pea protein which needs to be addressed to develop plant-based products which will be well appreciated by the masses. She concluded her presentation by quoting "variety" as the key to successful plant-based lifestyle by briefly discussing the various sources and lifestyle changes to achieve the same.

It was followed by our third speaker of the day Mr. Indranil Chatterjee, Regional Product Line Manager, Business Unit Protein, IFF. He delivered an insightful presentation on the topic *"Role of Soy Ingredients in growing acceptance of plant- based foods"*. He gave an overview of the market size and estimated growth of the plant-based market across the globe and in India. He highlighted the increasing social media interest in plant-based foods. He very well explained soy protein, which is a high-quality protein, meeting all the essential amino acids, and also explained its various health benefits. He concluded his presentation by speaking about the variety of soy protein formats such as soy isolates, soy concentrates, soy nuggets, and structured vegetable protein available in the market and showcased numerous soy products and innovative menus featuring them.



TATA NQ

COOKIES PACKED WITH GOODNESS OF FOSSENCE®

- Higher Spread
- Enhanced Binding
- Improved Texture For a Longer Duration
- Better Taste Profile

PREBIOTICS

TATA NQ

Contact us:

nutra@TataChemicals.com

www.TataNQ.com

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

SCAN FOR **FREE SAMPLES**

The last speaker of the day was, Ms. Fatema Noorani, Senior Officer Nutrition, Foods R & D, Marico Ltd. She spoke on the topic *"The impact of plant-based diets on health and environment"*. She began her presentation by showing us statistics about the global epidemic of non-communicable diseases focusing on how the majority of us are either undernourished, lacking some micronutrients, or are over nourished. She highlighted the importance of diet in reversing non-communicable diseases such as CVD, diabetes, cancer, chronic respiratory issues, etc.

She also very well correlated each condition alongside the diet and its benefits through various recent research. She emphasized that plant-based foods are the way forward and discussed in detail about oat protein, soy protein, and peanuts. She made a remarkable comparison between the lipid profile for animal and plant-based protein which results in increased fibre intake and improvement in dietary fat composition if one switches over to plant-based foods. Towards the end, she shared a few tips on how one could in a very simple yet effective way begin their journey towards plant-based foods.

Following each presentation, the speakers answered all the attendee's queries with great enthusiasm.

As a part of the Nutrition Awareness Activity, an online contest on "Sustainable Cuisine: Embracing the Plant-Based Revolution" was held for the undergraduate students of Food Science and Nutrition of Coimbatore.

The judges for the online contest were Mr. Ramasare Pal, Food Consultant- X, & Ms. Kavita Jadhav, Head – R&D- India and Global Emerging Markets - General Mills. The evaluation criteria included: Innovation, technical execution, nutritional balance, and presentation of the product. The judges were highly appreciative of the efforts put in by the students.

Dr T V Ranganathan, HOD, Professor of the Division of Food Processing Technology at Karunya Institute of Technology announced and congratulated the following winners of the contest.

1st Prize - Ms Akhila R &Ms Srimita S from Sri Shakthi Institute of Engineering and Technology for Omega Broc Sprout Twist. 1

2nd Prize – Ms Maria Sabu &Ms Seanna Kuriakose from Karunya Institute of Technology & Sciences for Vegan Mexican Jackfruit Burger Patties (Gluten–free). 2

3rd Prize – Ms. Priyanka P. & Ms. Gayathri S.S. from PSGR Krishnammal College for Women for Drumstick leaves with orange & papaya jam. 3

Three consolation prizes were given to the following students: Mr. Harish Theriraja T. S & Mr. Rohan Biju of Karunya Institute of Technology and Sciences for Terra Meat,

Mr. Jason Samuel J. & Mr Manoj A. of Karunya Institute of Technology and Sciences for Moringa - Oleifera Gulkand and

Ms. Abhirami VG & Ms Maryamul Asiya M. of Avinashilingam University for Nutri boost gummy.

Lastly, Ms. Samreen Shaikh, Jr. Food Technologist, PFNDAI offered a vote of thanks. She thanked all the sponsors for supporting and sponsoring the webinar, the

audience, and all the speakers for making the day's event successful.

The webinar recording is available on the link: https://fb.watch/pNK6YQs-0F/

REGULATORY ROUND UP

AUTHOR
Dr Shashank Bhalkar,
Executive Director, PFNDAI
executivedirector@pfndai.org

Dear Readers,

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

Provision in FoSCoS to file Updated/Revised Annual Return order Presently, FBOs are allowed to update the annual returns only till 31st May for the previous financial year. The present order allows FBOs to revise/ update the application beyond 31st May. Two amendments are permitted and the time slots for these are specified. The first slot extends up to 31st August with a payment amount equal to one-year license fees and the second up to 31st March with a payment amount equal to 2-year license fees. This is allowed two times at an additional fee. The provision has come into effect from 6th Jan 24. This is good step for ease of doing business.

Validity order of FSSAI laboratories The order gives a list of FSSAI laboratories the validity of their NABL accreditation as of 24th January 2024.

RESEARCH IN HEALTH & NUTRITION

Melatonin Use Soaring Among Youth

Science Dairy November 13, 2023

Nearly one in five school-aged children and preteens now take melatonin for sleep, and some parents routinely give the hormone to preschoolers, according to new research from the University of Colorado Boulder published in JAMA Pediatrics.

This concerns the authors, who note that safety and efficacy data surrounding the products are slim, such dietary supplements lack full regulation by the Food and Drug Administration."We hope this paper raises awareness for parents and clinicians, and sounds the alarm for the scientific community," said lead author Lauren Hartstein, PhD, a postdoctoral fellow in the Sleep and Development Lab at CU Boulder."We are not saying that melatonin is necessarily harmful to children. But much more research needs to be done before we can state with confidence that it is safe for kids to be taking long-term."

Melatonin is produced naturally in the pineal gland to signal the body that it is time to sleep and regulate its circadian rhythm -- the physiological cycle over a 24-hour period.In many countries, the hormone is classified as a drug and available by prescription only.In the United States, however, chemically synthesized or animal-derived melatonin is available over the counter as a dietary supplement, and increasingly available in child-friendly gummies.

During 2017-18, only about 1.3% of U.S. parents reported that their children used melatonin.To get a sense of the current prevalence of use, Hartstein and colleagues surveyed about 1,000 parents in the first half of 2023.Among children ages 5 to 9, 18.5% surveyed had been given melatonin in the previous 30 days.For preteens ages 10 to 13, that number rose to 19.4%. Nearly 6% of preschoolers ages 1 to 4 had used melatonin in the previous month.Preschoolers who used melatonin had been taking it for a median length of a year.Grade-schoolers and preteens had used it for median lengths of 18 and 21 months, respectively.The older the child, the greater the dosage, with preschoolers taking anywhere from 0.25 to 2 mg and preteens taking up to 10 mg.

In a study published in April, researchers analysed 25 melatonin gummy products and found that 22 contained different amounts of melatonin than the label indicated.One had more than three times the amount on the label. One had none at all.In addition, some melatonin supplements have been found to contain other concerning substances, such as serotonin."Parents may not actually know what they are giving to their children when administering these supplements," said Hartstein.

People With Obesity Burn Less Energy During Day

Science Daily November 15, 2023

Weight influences how and when bodies burn energy, new research indicates.

An Oregon Health & Science University study published in the journal Obesity found people who have a healthy weight use more energy during the day, when most people are active and eat, while those who have obesity spend more energy during the night, when most people sleep.The study also found that during the day, those with obesity have higher levels of the hormone insulin -- a sign that the body is working harder to use glucose, an energy-packed sugar.

"It was surprising to learn how dramatically the timing of when our bodies burn energy differed in those with obesity," said the study's first author, Andrew McHill, Ph.D., an assistant professor in the OHSU School of Nursing and the Oregon Institute of Occupational Health Sciences at OHSU."However, we're not sure why. Burning less energy during the day could contribute to being obese, or it could be the result of obesity."

McHill, Shea and colleagues organized a study that included people of different body sizes.A total of 30 people volunteered to participate in the study, which involved participants staying at a specially designed circadian research lab for six days.The study followed a rigorous circadian research protocol involving a schedule designed to have participants be awake and sleep at different times throughout each day.

After each period of sleep, volunteers were awakened to eat and participate in a variety of tests for the remaining time of each day.

One test had participants exercise while wearing a mask that was connected to a machine called an indirect calorimeter, which measures exhaled carbon dioxide and helps estimate energy usage.Blood samples were also collected to measure glucose levels in response to an identical meal provided during each day.

Mediterranean Diet Reduces the Risk of Cognitive Decline

Science Daily November 17, 2023

Old people who follow a Mediterranean diet are at a lower risk of cognitive decline, according to a study published in the journal Molecular Nutrition and Food Research.

This European study, part of the Joint Programming Initiative "A Healthy Diet for a Healthy Life" (JPI HDHL) was carried out over twelve years and it involved 840 people over 65 years of age (65% of whom were women) in the Bourdeaux and Dijon regions of France.

According to Cristina Andrés-Lacueva, UB professor and head of the CIBERFES group, "within the framework of the study, a dietary metabolomic index has been designed -- based on biomarkers obtained from the participants' serum -- on the food groups that form part of the Mediterranean diet. Once this index is known, its association with cognitive impairment is evaluated."

In the study, baseline levels of saturated and unsaturated fatty acids, gut microbiota-derived polyphenol metabolites and other phytochemicals in serum that reflect individual bioavailability were chosen as biomarkers.

Some of these indicators have not only been recognized as marks of exposure to the main food groups of the Mediterranean diet but have also been held responsible for the health benefits of the Mediterranean dietary pattern.

The metabolome or set of metabolites -- related to food and derived from gut microbiota activity -- was studied through a large-scale quantitative metabolomic analysis from the serum of the participants without dementia, from the beginning of the study.

Cognitive impairment was assessed by five neuropsychological tests over twelve years.

As a result, the study reveals a protective association between the score of the Mediterranean diet based on serum biomarkers and cognitive decline in older people.

According to Mercè Pallàs, professor at the UB

Neurosciences Institute (UBneuro), "the use of dietary pattern indices based on food-intake biomarkers is a step forward towards the use of more accurate and objective dietary assessment methodologies that take into account important factors such as bioavailability."

Fat Cells Help Repair Damaged Nerves

Science Daily November 28, 2023

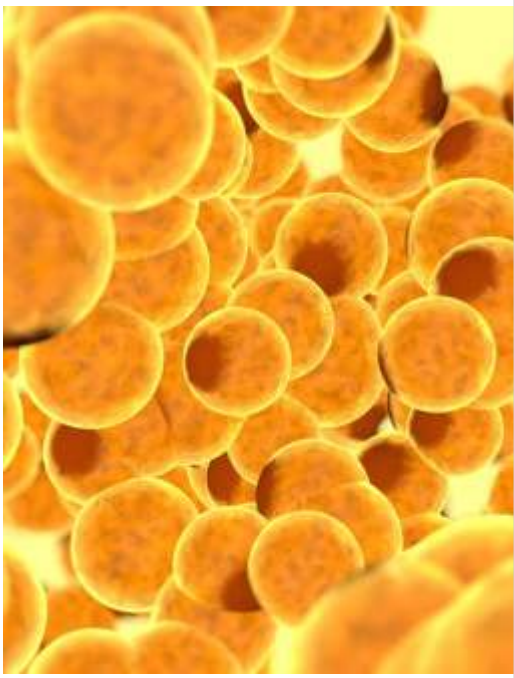
Damage to the body's peripheral nerves can cause pain and movement disorders. Researchers at the Leipzig University have recently investigated how damaged nerves can regenerate better.

They found that fat tissue strongly supports the Schwann cells needed for repair during the healing process. The results were published in the journal Cell Metabolism.

Our bodies are transversed by millions of nerve fibres that transmit information. This allows us to do things like control muscles and perceive sensory impressions. Peripheral nerves, like those in our arms and legs, are often damaged by acute injuries, for example, in accidents. As a result, those affected suffer from loss of muscle strength and sensory problems such as numbness.

Peripheral nerves do have a strong regenerative potential, but complete recovery of nerve function is still rare for reasons that are not yet fully understood. When a nerve is crushed or severed, the individual nerve fibres affected by the damage initially die. In principle, they have the ability to grow back and regenerate completely.

This depends on the Schwann cells that surround the nerve fibres. These cells do not die after nerve damage, but instead are responsible for coordinating the breakdown and regrowth of nerve fibres in their original areas. Schwann cells therefore play a key role in the repair process.



It was previously unknown how these cells cope with the enormous metabolic load associated with the breakdown and rebuilding of nerve tissue.

Researchers at the University of Leipzig Medical Center have now discovered that Schwann cells receive crucial support with nerve repair from the fat tissue that surrounds nerves in the body.

Using genetically modified mice, they have shown that the chemical messenger leptin plays a key role in this process. Leptin is mainly produced by cells in fat tissue and is known for its appetite-suppressing effects in the context of nutrition. Surprisingly, the current research project showed that leptin signalling is also an important factor in the repair of damaged nerves by Schwann cells."Leptin derived from fat cells stimulates the energy balance of the Schwann cells by activating their mitochondria," explains Dr Robert Fledrich from the Institute of Anatomy at Leipzig University and one of the two study leaders.

"At the same time, the mitochondria of the Schwann cells use parts of the damaged nerve tissue as an energy substrate so that successful regeneration can take place," adds Professor Ruth Stassart from the Paul Flechsig Institute of Neuropathology at the University of Leipzig Medical Center and co-leader of the study."The metabolism of the Schwann cells is therefore optimised for nerve regeneration and significantly promotes the restoration of the original nerve function," the two researchers explain.

The communication between fat cells and Schwann cells could potentially open up new treatment options that positively influence the metabolism of repair cells in the event of nerve damage. The researchers hope that the new findings will help to improve the regeneration of damaged nerves in humans in the future.

How Pre- and Postnatal B-12 Vitamins Improve Breast Milk Vitamin B-12 Levels, Which Supports Infant Brain Development

Science Daily December 1, 2023

Babies and children need vitamins, including vitamin B-12, to help their brains and bodies develop and grow. Babies get B-12 from their mothers and can have low levels of B-12 if their mothers had low vitamin levels during pregnancy and breastfeeding.

The vitamin B-12 levels of infants strongly depend on maternal levels. Adequacy of vitamin B-12 in breast milk is particularly important for infants during the first six months of life when breastfeeding is highly recommended. Even after the first six months of life, breast milk may continue to be a critical source of vitamin B-12 for infants.

Pregnant and lactating women are at exceptionally high risk for vitamin B-12 deficiency due to the increased nutritional demands as they provide the micronutrient for themselves and their babies.Many people receive the necessary B-12 the body needs from animal-source foods.However, in countries with low intake of animal-source diets, mother's and infant's deficiency in vitamin B-12 is a serious public health challenge. In resource-limited settings where maternal undernutrition is pervasive, researchers sought to understand the optimal timing and dosage of B-12 supplements during pregnancy and lactation.

A new study led by Mason Assistant Professor in the College of Public Health Dongqing Wang found that pregnant women who took high doses of oral vitamin B-12 supplements prior to delivery experienced short-term benefits on the levels of B-12 in their breast milk. However, women who took high doses of vitamin B-12 supplements during lactation experienced these benefits for a longer period of time.

"Understanding the impacts of prenatal and postnatal vitamin B-12 supplements on the level of B-12 in breast milk is crucial to design effective nutritional interventions to protect mothers and infants from vitamin B-12 deficiencies," said Wang, who was the principal investigator.

"Our findings underscore the importance of prenatal vitamins for short-term benefits in breast milk and postnatal vitamins for more sustained impacts on B-12 adequacy in breast milk; both prenatal and postnatal supplements support healthy growth and development in the baby."

The study also found that the effect of the prenatal vitamin B-12 supplement diminished when used together with the postnatal supplement.Likewise, the effect of the postnatal vitamin B-12 supplement diminished

when used together with the prenatal supplement.It appears that there was a certain plateau in the effect when prenatal and postnatal supplements were used together," said Wang.

"The plateau could mean that either prenatal or postnatal vitamins could correct maternal vitamin B-12 deficiency, but the plateau does not preclude the need for combined prenatal and postnatal supplements through pregnancy and breastfeeding to sustain maternal B-12 levels in populations with high levels of dietary inadequacy."

Study Finds Ultra-Processed Foods No More Palatable Than (Un)Processed but Experts Dispute Results

27 Nov 2023 Nutrition Insight

Based on an online study, UK researchers suggest ultra-processed foods (UPFs) are no more desired than processed or unprocessed foods, as previously assumed. Instead, they argue that carbohydrate-to-fat ratio and taste primarily determine whether people like a food, not their level of processing or energy density.

Foods that scored higher on liking (palatability) and desire to eat include those that combine equal amounts (in calories) of carbohydrate and fat — known as the "combo" effect in previous research — and those with an intense taste. Participants liked foods containing a lower fibre content.

"Our results challenge the assumption that ultra-processed foods are 'hyper-palatable,' and it seems odd that this has not been directly tested before," says the study's lead author, Peter Rogers, professor in the School of Psychological Science at the University of Bristol, UK. "However, while ultra-processing didn't reliably predict liking in our study, food carbohydrate-to-fat ratio, food fibre content and taste intensity did — together, these three characteristics accounted for more than half of the variability in liking across the foods we tested."

The researchers note that the study's outcomes support the theory that humans are programmed to learn to like foods with equal amounts of carbohydrates and fat.The study, led by the University of Bristol's Nutrition and Behaviour Group, aimed to test the common assumptions that food energy density (calories per gram), level of processing and carbohydrate-to-fat ratio primarily influence food liking and desirability.While the researchers planned to conduct a laboratory-based study, COVID-19 restrictions in the UK prevented face-to-face testing. The results are published in Appetite.

Instead, the team reverted to an online study, where 224 volunteers viewed colour images of familiar foods. Participants were randomized into one of three groups, focusing on energy-dense foods (32 foods), level of processing (24 foods) or carbohydrate-to-fat ratio (24 foods).

Based on the pictures, the participants rated the foods for taste pleasantness (liking), desire to eat (food reward) and sweetness, saltiness and flavour intensity (taste intensity). The researchers explain that the validity of this method was confirmed by a strong relationship between sweetness ratings and food-sugar content, as well as a correlation between saltiness ratings and food-salt content.

The authors note that the study method relates to how consumers judge familiar foods when anticipating eating.The study included 52 foods, including avocado, grapes, cashew nuts, king prawns, olives, blueberry muffins, crispbread, pepperoni sausages and ice cream.

Participants liked foods with higher dietary fibre content less, while those with a more intense sweet or salty flavour were more liked and desired."The results for sweetness and saltiness are consistent with our innate liking for sweetness and saltiness. And the results for carbohydrate-to-fat ratio and fibre might be related to another important characteristic that determines food liking," explains Rogers.

"We suggest that humans are programmed to learn to like foods with more equal amounts of carbohydrate and fat and lower amounts of fibre because those foods are less filling per calorie. In other words, we value calories over fullness."He adds that this preference helps humans maximize calorie intake and build up fat reserves when food is abundant. "This is adaptive when food supplies are uncertain or fluctuate seasonally, but not when food is continuously available more than our immediate needs."

Meanwhile, Mellor asserts that any claims that the study can "challenge the assumption that ultra-processed foods are 'hyper-palatable'" are hard to justify."Although this study showed that images of UPFs were not more desirable than less processed foods, this did not look at how much of these foods would have been eaten by the participants had they been given the opportunity."

For example, he shares that a previous study in the US showed that UPFs matched nutrients to less processed foods, resulting in greater consumption and calorie intake."There is no direct link between liking or desiring a food in a picture and finding it highly palatable when eating it. This is because simply seeing food is only one part of how much food will be chosen and eaten," underscores Mellor."Other factors such as its flavour, sensation and the biological changes in our bodies (such as hormonal and glucose changes), which result from eating a food, all influence how palatable and how much food is ultimately consumed."

Earlier this month, researchers in a WHO-backed study linked UPF consumption with a higher risk of chronic diseases, though not all food categories had the same association. Ultra-processed breads and cereals, as well as plant-based alternatives, lowered disease risk. Meanwhile, scientists proposed classifying UPFs rich in carbohydrates and fats as addictive substances. They found that around 14% of adults and 12% of children could be addicted to UPFs, which is a similar rate to addiction to tobacco and alcohol.

By Jolanda van Hal

Upcycling Coffee: Experts Flag Compound May Protect the Brain from Neurodegenerative Diseases

23 Nov 2023 Nutrition Insight

Researchers suggest that Caffeic-Acid Carbon Quantum Dots (CACQDs) derived from used coffee grounds may protect the brain cells from the damage caused by neurodegenerative diseases such as Alzheimer's, Parkinson's and Huntington's.

"Caffeic acid is known to penetrate the blood-brain barrier," Dr. Mahesh Narayan, chemistry and biochemistry professor at the University of Texas at El Paso, US and co-author of the study, tells Nutrition Insight.

"This is key since the intervention site is the brain and specific neuronal domains. We have capitalized on this property of caffeic acid to develop CACQDs with added free radical scavenging potential, which can prevent the soluble-to-toxic transformation of a model amyloid-forming protein, and can easily be further chemically tuned."

The study published in the Environmental Research journal reveals that CACQDs exhibit these properties when the neurodegenerative disease is triggered by factors such as obesity, age and exposure to pesticides and other toxic chemicals.

Protecting the brain

Neurodegenerative diseases are caused by the loss of neurons and other brain cells, which can lead to elevated levels of free radicals in the brain and a decreased ability to perform functions such as movement, speech, bladder and bowel control and a broad range of cognitive abilities.

"Elevated levels of free radicals in the brain are associated with factors like obesity, age and exposure to environmental toxins. CACQDs, via their sp2 hybridized chemical architectures, possess free radical scavenging properties and hence are neuroprotective," Narayan explains.

The team of scientists determined the neuroprotective properties of CACQDs through test tube experiments, cell lines and other models of Parkinson's caused by the pesticide paraquat. CACQDs were observed to remove free radicals and prevent them from causing damage without causing any side effects.

Caffeic acid is a polyphenol, the plant-based compound is known as an antioxidant with free radical-scavenging properties. Its ability to penetrate the blood-brain barrier allows it to affect cells inside the brain.

"In sporadic and idiopathic forms of Parkinson's and Alzheimer's, free radicals play a role in the onset and progress of pathology. Our CACQDs are likely to be successful therein. Huntington's is familial (genetic). Therefore, in the case of Huntington's and around 5% of familial Alzheimer's and Parkinson's, our CACQDs are less likely to be effective," Narayan continues.

"Nevertheless, we still need to evaluate whether they can intervene in preventing the misfolding of mutant huntingtin protein, which would then make them effective against Huntington's as well."

Speaking about how early in the progression of diseases like Alzheimer's or Parkinson's it is most optimal to begin this treatment, Narayan says, "The earlier, the better. Prevention is always better than cure."

"Any current treatments that can address advanced symptoms of neurodegenerative disease are simply beyond the means of most people. Our aim is to come up with a solution that can prevent most cases of these conditions at a cost that is manageable for as many patients as possible."

By Milana Nikolova

Reduced Salt Intake Rapidly Reduces Blood Pressure, Experts Reveal

15 Nov 2023 Nutrition Insight

Akin to antihypertensive medication, US-based researchers suggest that restricting dietary sodium lowers blood pressure among middle-aged and elderly patients significantly.

In a clinical trial, participants reduced their systolic blood pressure by an average of 8 mm/Hg after just one week."Our results indicated that with dietary sodium reduction, lowering of blood pressure can occur safely and rapidly. The amount of reduction we found was comparable to that of a first line antihypertensive medication," Deepak K. Gupta, co-author of the study, assistant professor of medicine at Vanderbilt University Medical Center, tells Nutrition Insight. The trial study included 213 participants aged between 50 and 75 which were allocated to a high-sodium diet group and a low-sodium diet group. In the second group, nearly 75% of participants lowered their systolic blood pressure. Further discussing the clinical significance of the average 8 mm/Hg reduction in systolic blood pressure and its relevance to overall cardiovascular health, Gupta says that prior studies have

indicated that a 5 mm Hg reduction in systolic blood pressure is associated with 15 to 25% reduction in death, so an 8 mm Hg reduction would be expected to be meaningful.

The trial outcome, published in Jama, may carry significant implications for public health and personalized treatment for hypertension."I think we can tell patients for whom blood pressure is a concern that reduction in dietary sodium will likely lower their blood pressure and for some it may achieve a similar result to a single blood pressure medication. This may motivate patients who are particularly interested in cutting down on their number of medications, but they have to reduce dietary sodium intake to get there," says Gupta.
By Milana Nikolova

Lifestyle Interventions: Digital Platform Manages Childhood Diabetes

15 Nov 2023 Nutrition Insight

India-based health-tech start-up Fitterfly reports significant successes in managing type 2 diabetes in children with its digital app-based platform featuring personalized lifestyle interventions.

The platform is now ready for use as cases of childhood diabetes are rapidly rising.According to the company, type 2 diabetes cases, previously only diagnosed in adults, have increased significantly among Indian children, especially around puberty. Additionally, the company states that junk food, lack of an active lifestyle, high-stress levels and excessive screen time are causing obesity, polycystic ovarian disease (PCOD) in girls, prediabetes and type 2 diabetes.

"Diabetes no longer respects age," says Dr Sanjay Kalra, an endocrinologist and president of the South Asian Federation of Endocrine Societies. "Type 2 diabetes is becoming increasingly common in children and adolescents.These children and their families need hand-holding. Digital therapeutics is a good means of supporting and strengthening their support system. 1.9 points reduction in HbA1c speaks for the efficacy and efficiency of Fitterfly digital therapeutics in young persons with diabetes."

Twenty-six children were enrolled for two years in the app-based Fitterfly Diabetes program. Eleven participants had type 2 diabetes, while 15 had type 1 diabetes. Seven type 2 candidates finished the program with reduced blood sugar (HbA1c), a 1.9-point reduction.This reduction is equivalent to or better than a combination diabetes oral therapy. In the same time frame, another 25 kids who enrolled in the Fitterfly weight loss program lost 4.1 kg in three months, demonstrating that digital programs can be highly effective.

A stand-out case from the program was a 14-year-old boy whose blood sugar levels decreased from 8.9% to 6.1%. The combination of nutrition, fitness and psychology interventions via the Fitterfly app helped him eat better, avoid junk food mindfully, exercise, reduce screen time and manage school-related stress.

"While technology has been the bane for the health of children, leading to rising diabetes incidence, we have successfully shown how technology can be used to help overcome diabetes as well. With the right strategies, commitment and technology, we can reverse the tide of pediatric diabetes," says Dr.Arbinder Singal, co-founder and CEO of Fitterfly.
By Inga de Jong

Fermented Foods: Study Identifies Lactic Acid Bacteria in Kimchi with Robust Defence System

02 Nov 2023 Nutrition Insight

Researchers at the World Institute of Kimchi have isolated lactic acid bacteria (LAB) strains from kimchi with high levels of resistance to phages — viruses that infect and replicate within bacteria.

The team sourced the *Pediococcus inopinatus* strain from *Mukeunji* — a long-term fermented kimchi that is in the final stage of fermentation.

According to the researchers, the isolated *P. inopinatus* strain has a better defence system against gene invasion than *Lactiplantibacillus plantarum*, a bacteria strain commonly used in probiotics that is also present in kimchi.

They suggest that *P. inopinatus* may have an immune role against mammalian viruses as well, though further research is needed.

To determine the genetic traits of the identified LAB, the research team collected 34 samples of kimchi that were fermented for over six months at temperatures between -2 and 10° from all over South Korea.

In over 88% of the analysed samples, *P. inopinatus* was the dominant species. Kimchi is a lactic acid-fermented vegetable product. The researchers note that, unlike fermented dairy products produced in a sterilized-closed fermentation system, kimchi is created through spontaneous fermentation.

This is initiated by various microorganisms in the product's raw materials in a non-sterilized-open fermentation system. As a result, various LABs are involved in kimchi fermentation. Which strain is dominant and when they're dominant depends on the environment.

By Jolanda van Hal

FOOD SCIENCE & INDUSTRY NEWS

Transforming supplements: Innovative candyceuticals set to debut in APAC markets

16 Nov 2023 Nutrition Insight

Boncha Bio has announced a strategic move to transform the dietary supplement market with the introduction of candyceuticals — a concept that combines sweetened taste sensations with nutraceutical health benefits.

The partnership has unveiled the NutriBurst product line. Officially signed at the Vitafoods Asia 2023 exhibition in Bangkok, Thailand, the collaboration aims to utilize Boncha Bio's candy capsule technology with nutrient and supplement knowledge and offerings.

"In Asian markets, particularly South Korea and Japan, the constant demand for novel formats and unique consumer experiences is reshaping the market," says Ling Rei-Ting, regional MRS lead for the Asia-Pacific (APAC) area at dsm-firmenich. "Consumers are leaning toward more natural, pleasurable ways to consume supplements." The market-ready solutions will fall under the company's Health, Nutrition and Care business unit in Asia.

"These candy-textured capsules with active ingredient fillings are named candyceuticals, and they come in two forms — candy capsules and candy tablets," reveals Alfie Tsai, the managing director of Boncha Bio. "Utilizing micro-carrier technology, our candyceuticals achieve unparalleled absorption rates. The joyful consumption and fast-onset experience enhance consumer compliance, exceeding 95%."

Edited by William Bradford Nichols

Holistic Well-Being: Nutraceutical Industry Branches Out to Beauty, Mood, Healthy Aging and Weight Loss

10 Nov 2023 Nutrition Insight

Consumers continue searching for supplements that support more than physical well-being, prioritizing holistic health benefits and looking for solutions in new health areas, such as mental health, beauty, relaxation, healthy aging and natural weight management solutions. Though demand for natural ingredients is still growing, industry experts highlight the need to improve ingredient absorption for improved efficacy.

Nutrition Insight continues its conversation on developments in the nutraceutical market with Lubrizol Life Science, Giellepi, Lonza Capsules & Health Ingredients, Lycored and Nektium.

The professionals emphasized that enhancing efficacy and convenient formats are critical innovation drivers in the sector. “There is a significant focus on overall wellness and mental health within this space,” says Isabel Gómez, global marketing manager of nutraceuticals at Lubrizol Life Science.

“With higher stress levels and sleep concerns, consumers are looking for products that promote improved sleep and help reduce stress, to which brands need to respond.” Moreover, she asserts that as the impact of the pandemic lingers, consumers continue to demonstrate a heightened level of concern about their immune health.

Claudia Antenozio, scientific marketing executive at Giellepi, adds: “One rapidly growing area of focus for formulators is related to those multifunctional ingredients that can address more than one health concern at the time, thus supporting holistic well-being. For instance, ingredients that promote immune and gut health or solutions designed to support sleep while boosting energy.”

Holistic health is a key trend right now, agrees Emily Navarro, global marketing manager at Lonza Capsules & Health Ingredients. “Consumers of all ages recognize the importance of overall health and well-being in realizing their personal health and wellness ambitions. As such, they’re looking for products that can support various health benefits — from joint and gut health to energy and endurance.” She details that popular nutraceutical ingredients supporting some of these health goals include collagen, such as UC-II undenatured type-II collagen, and probiotics.

Caroline Schroeder, marketing communications manager at Lycored, also sees an opportunity to lean into holistic solutions across all aspects of health and wellness, “including heart health, exercise recovery, eye health, skin protection, graceful aging and more. As the wellness and beauty categories continue to grow, there is a parallel opportunity to bolster our offerings and expand on the body of evidence around our wellness portfolio to explore further and discover the efficacy of our solutions to deliver powerful health and wellness benefits that allow people to feel their best in their skin.”

Along with a growing demand for holistic health solutions, industry experts see increased interest in ingredients for a wide range of benefits. For example, Schroeder points to a growing demand for solutions that “support beauty and overall health and wellness” over the last few years. Antenozio states that there is a shift in consumer preferences toward natural and holistic solutions, as “several plant-based ingredients such as turmeric, ashwagandha, elderberry and omega-3 from algae are a staple in many markets.”

At the same time, Gómez from Lubrizol Life Science details a renewed interest in vitamins and minerals that have well-known health-validated claims and are expected to have increased demand in new product developments. "Examples could be vitamin C, iron and zinc, which support immune health while improving other health benefits."

"There is also an increasing interest in botanical extracts such as Ayurvedic ingredients like curcumin or micro-algae extracts like astaxanthin. These ingredients are well known to have potent antioxidant and anti-inflammatory properties that can benefit overall health and reinforce the immune system."

Nektium's Florido adds: "We're seeing more functional beverages containing botanicals, adaptogens, nootropics and amino acids. These ingredients had been almost exclusively limited to conventional formats such as capsules and powders. Still, brands are adapting to meet consumer demand for convenient, tasty beverages with the same functional benefits."

By Jolanda van Hal

Conventional Dairy to Dominate in Developing Countries Amid Plant-Based Cost Restrictions

06 Nov 2023 Nutrition Insight

Alt-dairy innovation is reaching new heights in North America, Western Europe and Australasia, where more than half of all "dairy" launches were non-dairy alternatives in 2022, according to Innova Market Insights. In these regions, a milk renaissance is underway, with plant-based sources usurping dairy milk at the breakfast table and precision fermentation promising a new era for sustainable cheese and ice cream.

But the buzz of alternative dairy is far from a worldwide phenomenon, with most activity staying local to developed economies with higher purchasing power. And while dairy consumption in the US is levelling off, the nutrition source is gaining ground in lower-income areas as a versatile, affordable and shelf-stable food that can help budgets stretch in a tough economic climate. Dairy ingredients were also recently highlighted by suppliers as key sources for addressing malnutrition by providing protein and serving as a base for fortifiers. The World of Food Ingredients sits down with Krysta Harden, president and CEO of the US Dairy Export Council (USDEC) — a non-profit membership organization that represents the global trade interests of US dairy — to discuss the rise of dairy alternatives and the role "real dairy" plays in nourishing massive populations worldwide.

Consumers now can make more choices, especially in developed countries. And over time, there will be more and more products. But right now, many alternatives are trendy for a while, and then one replaces the other. So we'll have to see long-term really what has long legs and what is going to be part of a more stable diet. We need to recognize that there are a lot of consumers who won't have access to those choices because of price. They won't have the variety that consumers in Europe or North America might enjoy.

Many families around the world are trying to make ends meet. For example, in the Philippines, 40% of their income goes to food, so they're going to be very choosy on price and how to get the most value out of a product that the whole family will eat. We must recognize what's happening in a global population at all levels. In many parts of the world, if you have a cow, you can feed your family and maybe your neighbours. It's about more than just those with the income and the resources to be choosy. We have to look at everybody and make sure they're getting a good healthy diet.

By Missy Green

Postbiotics Aiding the Convergence Between Foods, Beverages, & Supplements

By Stephen Daniells 16-Nov-2023 Food Navigator USA

With 9% growth predicted from 2021 to 2026 and the surging consumer interest in non-pill delivery formats, postbiotics could be primed to rival probiotics in a few years, according to ADM's Vaughn DuBow.

DuBow, ADM's Global Director of Marketing – Microbiome Solutions, speaking with NutraIngredients-USA at SupplySide West 2023, said he predicts that postbiotics will match probiotics in the next few years, because there's tenfold more interest. "The increasing attention on postbiotics can be attributed to the strains' robustness," he said. "When working with heat-treated postbiotics, formulators don't have to make adaptions for live colony forming units (CFUs).

"This enables postbiotics – such as the heat-treated postbiotic versions of our BPL1(Bifidobacterium animal is subsp. lactis CECT8145) and ES1 (Bifidobacterium longum CECT7347) strains – to survive during harsh processing conditions like high heat or water content. This makes them suitable for a nearly limitless range of foods, beverages and dietary supplements, answering consumers' calls for more wellness offerings that can fit their individual lifestyles and personalized goals."

The potential is supported by data from Lumina Intelligence, which tracks the ecommerce market including online sentiment. According to a January 2023 report, Lumina was tracking over 400 postbiotic products around the world marketed via ecommerce platforms. The leading market globally was Japan with 72, followed by South Korea (43), and then the US (40).

Postbiotics have burst onto the scene over the past couple of years, particularly following the publication of a consensus definition by the International Scientific Association for Probiotics and Prebiotics. ISAPP defines a postbiotic as "a preparation of inanimate microorganisms and/or their components that confers a health benefit on the host."

So, what does the data show in terms of efficacy between pro- and postbiotics? "Research on the efficacy between probiotics and postbiotics depends on the strain itself," said DuBow. "With a larger body of research currently concentrated on probiotics, health and wellness brands, along with consumers, may reach for a probiotic that has shown to provide the targeted wellness support they're seeking.

Beyond Product Innovation: Affordability and Accessibility Take Centre Stage in Meeting Asia's Nutritional Needs

By Pearly Neo 14-Nov-2023 – Food Navigator Asia

Affordability and accessibility are just as important as product innovation if food firms are going to helpmeets Asia's nutritional needs, in a region that is still beset by childhood stunting and rising rates of obesity and diabetes.

This was the opinion of an expert panel which convened at the recent Asia Pacific Agri-Food Summit held in Singapore, comprising of Kellanova VP R&D AMEA Yanjing Wang, Friesland Campina Regional President Asia Corine Tap, A*STAR Deputy Executive Director SIFBI Professor Christiani Jeyakumar Henry, and Dole Specialty Ingredients Managing Director Weitze Ooi.

The panel was chaired by FoodNavigator-Asia and NutraIngredients-Asia Editor-in-Chief Gary Scattergood.

"The COVID-19 pandemic really brought health concerns into the spotlight and made that connection between health and food," Tap told the floor. "This was a good thing, but at the same time we also saw affordability challenges go up which meant that a lot of consumers may have wanted to eat healthier and more nutritious, but could not get these products due to cost limitations. So what we as food and beverage firms need to do is not only innovate in terms of fortification or reformulation and the like, but also look at increasing accessibility to these healthier, more nutritious products or consumers will always be limited by that".

Prof Henry highlighted that the biggest nutritional challenges in Asia today are Type II diabetes, nutrition for the elderly and nutrition for lower income groups which calls for more affordable nutrition options. "The right nutrition is very important as it has impacts on issues such as stunting, the rates of which can be as high as 30% to 40% in some countries and this in turn has impacts on areas such as birth rate and work performance as it really is a very multifaceted etiology," he said. "It also has very poignant impacts on the elderly and there really aren't very many options in supermarkets for things such as geriatric foods – older people need better nutrition to make up for their reduced appetites, which means that these foods in turn need to be highly palatable, high in nutrition and especially protein to ensure they have enough energy and protein to ensure that muscle loss does not come into play. Muscle maintenance is so important as losing this means a loss in agility, which leads to higher chance of falls and thus the increase of even more serious issues as a result."

Wang stated that the nutritional issues facing different demographics across the different APAC markets are far from unilateral, even within the same market. "We have seen that in each country, the nutritional challenges are different and unique between the various ages, genders, socio-economic status and beyond," she said.

The 'And' Consumer: Affordable Nutrition Trend Gains Further Traction in APAC Amidst Dairy and RTE Category Growth

By Pearly Neo 31-Oct-2023 – Food Navigator Asia

Asia Pacific consumers are increasingly demanding a combination of affordability, health and tastiness when making their food and beverage purchasing decisions, driving the rise of what is known as the 'and' consumer.

The demand for health, nutrition and deliciousness in food and beverage products has been on trend in APAC for several years now, especially after the COVID-19 pandemic hit, but in the more recent past the added element of affordability has also gained significant traction amidst rising economic and inflationary challenges. "What this means is that food and beverage firms now have to cater to even more consumer expectations than before, and especially here in APAC we are seeing the rise of what is called the 'and' consumer," Ingredion VP and General Manager ASEAN Ray Deidrick told FoodNavigator-Asia at the recent Fi Asia 2023 show in Bangkok, Thailand.

"This basically means consumers looking for products that are Healthy AND Tasty AND affordable, which calls for the manufacturers to need to invest in wider ingredient portfolios in order to combine formulations and create more 'ands' for them. "The expectations differ across different consumer groups and in different product categories – consumers don't always expect nutrition in every single item, but the 'ands' are what can really differentiate premium from mass market products."

This is in tandem with the rapid rise of categories such as ready-to-eat (RTE) products in the region, which have the potential to integrate more 'and' elements into these, such as convenience and quality. RTE meals in particular have seen a fair bit of popularity here due to the convenience element in recent years after the pandemic, but at the same time consumers also want to feel that they are able to eat 'real food'," he added. "So in addition to everything else, there is a need to elevate their experience with these RTE products to give them that feeling of eating out despite, by improving areas such as the quality and presentation, and not only focusing on the convenience element."

Start-Up's Chickpea-Based Protein Isolate Boosts Protein Content in Dairy-Free Cheese

By Augustus Bambridge-Sutton 01-Nov-2023 – Food Navigator USA

Israel-headquartered plant-based ingredients start-up ChickP has developed a chickpea-based protein isolate that can be incorporated into a range of cheese substitutes.

The chickpea protein isolate has 90% pure chickpea protein content. ChickP utilises all components of the chickpea without waste, and the product can be incorporated into plant-based cheese products.

"ChickP specializes in producing chickpea isolate, with 90% pure chickpea protein content," Liat Lachish Levy, CEO of ChickP, told FoodNavigator. "This high protein content not only sets ChickP apart but also makes it an ideal choice seamless integration into manufacturer's recipes, which elevate taste and texture of dairy analogs, particularly cheese."

"At ChickP, we tailor our product applications to the cheese analog market, primarily using established industry methods." Maor Dahan, ChickP's Head of Applications and Development, told FoodNavigator. "In the cheese analog production process, we incorporate fermentation to enhance the final product's quality and abundance. In certain cases, we also develop specific recipes to facilitate the seamless incorporation of our chickpea 90% isolate into cheese analog production."

The analog provides an abundance of protein to a cheese substitute but, according to CEO Levy, also maintains the taste and texture of any plant-based dairy product it is incorporated into.

"This is particularly important because traditional protein alternatives often alter the sensory qualities of the final product. Chickpea protein isolate is the winning solution to include in cheeses analogs."

Kickstarting Kale: Chinese Trend For 'Punk Nutrition' Lifestyle Opens Major Functional Food Innovation Opportunities

By Pearly Neo 28-Nov-2023 – Food Navigator Asia

Chinese consumers' increasing demands for functional and fortified foods and beverages to support a lifestyle based on 'punk nutrition' has opened up massive innovation opportunities for brands across various product categories.

The term 'punk nutrition' was coined in China, describing a lifestyle where consumers engage in hard work for 10 hours or more a day, and attempt to make up for this with high-quality nutrition and supplements. "These consumers still want to live longer and better even though they have no choice but to turn to punk nutrition to sustain their stressful working lifestyle, and this means they are more willing than before to pay for products that can help them to do this," Cargill EpiCor Global Growth Lead Ling Li told FoodNavigator-Asia at the recent Fi Asia 2023 show in Bangkok.

"We estimate that this willingness comes to about US$20 to US$30 monthly, and we have seen that the average age groups buying these healthier products has decreased over the years and now stands at about 25 to 35 years of age. This demand for health and wellness is not limited to dietary supplements but also nutritionally fortified foods with desired functionalities such as biscuits with prebiotics or probiotics, or beverages which are always a popular choice during the summer seasons."

It is also increasingly important to appeal to consumers when it comes to the specifics and value-adds that can be found in such products, especially with more and more brands catching on and creating products for this market. "The competition in this functional and fortified foods market has become increasing fiercer over the years, and consumers all want something that is different and that stands out," she added. In China, kale is a superfood that is well-known and considered a very healthy product, but everyone already knows this – the only way for products like this to really stand out would be to add to its value and functionality. "So for us as an example, we have created a new kale beverage product that includes postbiotics in it, which makes for an increase value proposition due to the improved immunity benefits and this allows for a price premium justification."

That said, this demand for healthier products is not limited solely to China – Li stressed that the COVID-19 pandemic has led to consumers all across the region expressing higher demand for such items. "Similar to Chinese consumers, we see many consumers across APAC now willing to spend more money to be healthy," she said.

"This is especially so amongst the elderly – where previously their mindsets were all about saving money as much as possible, and the only concept of 'healthier food' available was things like plain congee, now they know that there are options out there that can help them live better and longer, and are increasingly aware of the need of foods with protein to keep them strong."

Healthy ageing is a major topic in large elderly populations such as Japan and South Korea, with many products already being developed to target these consumers.

Ultra-Processed Foods, But Not Bread or Breakfast Cereals, Linked to Multimorbidity: The Lancet

By Augustus Bambridge-Sutton
16-Nov-2023 – Food Navigator USA

A recent study published in medical journal The Lancet has found that ultra-processed food (UPF) consumption is often linked to multimorbidity. However, the study found no link between multimorbidity and consumption of UPFs including breakfast cereals, packaged bread, and plant-based alternatives.

Multimorbidity is when one develops two or more chronic diseases, such as cancer, cardiovascular disease, and type-2 diabetes. The study, which analysed the diets of 266,666 Europeans across seven countries (Denmark, Germany, Italy, Spain, Sweden, the Netherlands, and the United Kingdom), showed that while consumption of some UPFs is linked to multimorbidity, not all UPFs are the same. Plant-based alternatives are, in fact, not linked to multimorbidity, while breakfast cereals and packaged breads were linked inversely so.

The participants, who upon beginning the study were free of cancer, cardiovascular disease and type-2 diabetes, were recruited between 1992 and 2000. They filled out questionnaires on their diet, the results of which were assessed through the Nova classification (see fact box). Foods given the classification of four were considered ultra processed, or UPF (however, alcohol consumption was excluded from the study). As many of the foods assessed were consumed in the 1990s, the study took into account the time and place the food was produced when ascertaining its level of processing.

The Nova classification is a classification system which assesses the level of processing that a certain food has undergone. These range from 1) unprocessed or minimally processed foods;2) processed culinary ingredients; 3) processed foods and 4) ultra-processed foods. Ultra-processed foods include biscuits, processed meat, instant noodles, plant-based alternatives and ultra-processed bread.

Every three or four years, the participants were checked and asked whether they had developed a major disease. Once participants had developed multimorbidity, died, or their data was lost, they exited from the study.

The first disease each participant developed was noted first. 21,917 developed primary cancers, 10,939 experienced cardiovascular events, and 11,322 experienced type-2 diabetes events.

The most common multimorbidity pattern was cancer developed after cardiovascular disease, followed by cancer developed in people with type-2 diabetes, followed type-2diabetes developed in those with cardiovascular disease. The study also assessed the links between different types of UPF and the level of development of multimorbidity. Not every UPF had the same effect on these links.

UPFs most strongly linked to the development of multimorbidity were processed animal products and sugary drinks. The consumption of sauces, spreads and condiments also showed a positive association with the development of multimorbidity, but with a lower level of certainty. However, packaged breads and breakfast cereals showed an inverse link with the development of multimorbidity. Alongside this, sweets and desserts, savoury snacks, ready-to-eat/heat mixed dishes, plant-based alternatives and other unspecified ultra-processed foods did not present the link at all.

The health quality of plant-based alternatives is often called into question. A recent study, for instance, showed that it lacks certain animal-linked micronutrients, such as iron and zinc. However, the current study suggested that unlike many of its UPF brethren, it is not linked to multimorbidity.

Fact box: Some limitations were present. For example, the foods were processed a long time ago. This, while taken into account in the study, also meant the processing data for each food at the time wasn't always available. Furthermore, researchers did not evaluate whether participants changed diets after developing their first disease. Thirdly, some treatments, such as that for type-2 diabetes, were not taken into account. Finally, study participants do not necessarily represent the general population.

Better-For-You Munch: Why APAC Healthier Snacks Sector Must Step Up Functionality and Freshness to Ensure Growth

By Pearly Neo 22-Nov-2023 – Food Navigator Asia

The better-for-you snacks sector in Asia Pacific will need to step up its focus on product functionality and freshness if it is to build on the boom it has enjoyed in recent years.

Better-for-you, healthier snacks came truly into the spotlight as a sector of its own during and after the COVID-19 pandemic, when consumers of all ages and demographics across APAC responded with heightened interest in healthier diets. Such has the growth of this industry been that today it is no longer enough for products to simply be lower in sugar or salt than other competitors, but also need to offer added functionality and benefits in order to capture the interest of consumers here.

"What we are seeing is that in snacking it is not only better-for-you or healthier that are key, but also functionality as consumers start to demand and expect more from these products," Nudie Snacks Founder Tracey Hogarth told FoodNavigator-Asia. "So, things like high fibre, high protein and low calories are becoming more and more dominant when it comes to new product development in snacking, so consumers can specifically see what extra benefits they can get from these. Snacking as a whole has really changed over the years, but consumers always want snacks that taste really good with a good flavour – thing is that now, these must also be really good for them calories-wise as well as containing the plant-based proteins they want."

Freshness has also emerged as a very important aspect in healthy snacking, as this is a characteristic that consumers very much associate with high quality and even good taste. "This is where Nudie Snacks has an advantage, as we use fresh batches of vegetables to make our vegetable snacks, and these are very different from just processed potatoes or extruded corn chips," she said. "As the as the trends start to grow, we believe that more and more vegetable crisps will be appearing on the shelves, with very limited preservatives or colours.

REGULATORY NEWS

EU To Reauthorize Glyphosate for Ten More Years Despite Lack of Conclusive Vote

17 Nov 2023 Nutrition Insight

The European Commission (EC) failed to secure the votes of a qualified majority from member states during yesterday's Appeal Committee on the reauthorization of glyphosate use in the bloc. The inconclusive vote means that the EC now has full authority to make decisions on the matter.

"The EC confirms that no qualified majority was reached, supporting or rejecting its proposal, first at the Standing Committee on Plants, Animals, Food and Feed in a vote held on October 16 and again at the Appeal Committee held on November 16," Stefan de Keersmaecker, EC coordinating spokesperson for the European Green Deal and spokesperson for health and food safety, tells Nutrition Insight.

"The EC has the legal obligation to take a decision on the renewal in the absence of a qualified majority at the Appeal Committee. Taking into account the fact that the current approval of glyphosate expires on 15 December 2023, the EC will now proceed to renew the approval of glyphosate in the coming weeks," he adds.

Experts and scientists have expressed concerns about the proposal, citing fears that the use of glyphosate impairs the nutrient content of crops, along with various other concerns related to public health and environmental degradation.

The Glyphosate Renewal Group (GRG), a consortium of companies that requested the EC to reauthorize the chemical in 2019, responded to concerns by pointing to a clearance granted following an investigation by the EU Food Safety Authority (EFSA) and the European Chemicals Agency (ECHA).

By Milana Nikolova

Sifter Solutions Introduces "Scan By Diet" Barcode App For Consumers With Specific Dietary Needs

09 Nov 2023 Nutrition Insight

A new grocery food packaging scanning smartphone application allows customers to match products to their personal diet and health needs.

The service is being launched by Sifter Solutions, a food and nutrition technology provider designed for food retailers, health and insurance platforms.

"Sifter Scan By Diet allows the shopper to set their own personal diet profile, using scientifically accurate toggles, before scanning. This is critically important for persons with, for instance, a medical condition like diabetes or food allergies," Pierce Hollingsworth, chief content officer at Sifter Solutions, tells Nutrition Insight.

The service responds to the current market demands driven by Gen Z and millennial customers, of which close to 75% buy specific foods for specific health benefits. According to The Food Industry Association, 44% of Gen X and baby boomers have the same food purchasing habits.

The Scan By Diet application can be used to select and combine a variety of diets, such as those prescribed for specific health conditions like diabetes, hypertension and food allergens. "When scanning the packaging of the food products, they can instantly see whether it's appropriate for their custom diet."

A green check following the scan means that the food is suitable to the diet selected in the customer's profile. A red X means the opposite, and the application suggests alternatives. "If a product is not, Sifter then suggests similar products that will meet their diet specifications," explains Hollingsworth.

"People can personalize their shopping experience to their specific health profile and preferences. Sifter dramatically and accurately speeds the shopping process and helps people support their diets while offering a wider variety of appropriate food options."

By Milana Nikolova

Experts Call For "Robust Social Media Policies" On Muscle-Building Supplement Content

07 Nov 2023 Nutrition Insight

International researchers urge social media companies to implement stricter and more explicit policies regarding advertising and user-generated content for muscle-building supplements. These products currently face few restrictions, while social media is associated with the use of these products.

The authors of the recent study note that using muscle-building drugs and supplements has been linked to adverse health and social outcomes.

Meanwhile, user-generated and advertising content related to illegal muscle-building drugs is prohibited across the eight platforms examined in the study.

"These findings are concerning given that the use of muscle-building dietary supplements can have negative social and behavioural effects, which adolescents and young adults may be particularly susceptible to," says lead author Kyle T. Ganson, Ph.D., assistant professor at the University of Toronto's Factor-Inwentash Faculty of Social Work. There is a need for robust social media policies, as well as federal public policies in Canada, to protect the health and well-being of these populations."

Given the global reach of social media, the authors suggest social media companies should prohibit content and advertising that influences poor body image and esteem while fostering a healthy online environment, thereby aligning advertising for muscle-building supplements with those of weight loss products. They also call for an improved oversight of users and advertisers through algorithms and moderators.

"Social media is a major driver of the use of muscle-building dietary supplements among adolescents and young adults, and many young people seek out information on the purported benefits and means of using these supplements via social media," highlights Ganson. It is important that healthcare, public health and policymaking professionals are alerted to the major gap in content and advertising policies regulating what is posted on social media and how this may influence the behaviours of young people."

The study, published in Substance Use & Misuse, found that user-generated content and advertising related to legal muscle-building supplements, such as creatine monohydrate and whey protein, had few restrictions on social media. At the same time, their use is common among adolescents and young adults. While research has examined the advertising and content policies of social media companies regarding the use of alcohol, tobacco and unhealthy foods or beverages, the authors note a limitation in research on policies for muscle-building supplements.

The researchers analysed content and advertising policies for YouTube, TikTok, Instagram, Snapchat, Facebook, Twitter, Twitch and Reddit in November 2022 to determine whether there were any provisions related to legal (e.g., whey protein) and illegal (e.g., anabolic-androgenic steroids) muscle-building drugs and dietary supplements.

The research team classified policies as non-existent, restricted or prohibited. The authors note that all eight platforms used explicit policies to prohibit user-generated content and advertising of illegal drugs and substances, such as anabolic-androgenic steroids, while policies on supplements vary.

Edited by Jolanda van Hal

ASCI Issues Guidelines to Ensure Honest Environmental Claims in Ads

AFAQS! NEWS BUREAU: 18 Jan 2024

'Guidelines for Advertisements Making Environmental/ Green Claims', will be effective in the public domain from February 15, 2024.

The Advertising Standards Council of India (ASCI) has issued its guidelines to prevent false pro-environment claims, also known as greenwashing, that has been seen across sectors. These 'Guidelines for Advertisements Making Environmental/ Green Claims', have been in the public domain for consultation since November 16, 2023, and were approved in the recent Board of Governors meeting.

Effective February 15, 2024, these guidelines aim to ensure that environmental claims made by advertisers are reliable, verifiable, and transparent. Consumers are increasingly demanding products and services which minimise harm to, or have a positive effect on, the environment. As a result of a proliferation of products, services and businesses which claim to meet that demand it is imperative for such claims to be reliable and verifiable.

Greenwashing refers to unsubstantiated, false, deceptive, or misleading environmental claims about products, services, processes, brands or operations as a whole. It is often seen that products make such broad claims although only a very small component or part of the product is green.

The ASCI guidelines require advertisements to make specific claims limited to the part of the product or service that actually has the environmental benefit. Advertisements must not claim an environmental benefit that results from a legal obligation if competing products are subject to the same requirements. The guidelines also require that all seals and certifications must be from accredited organisations. Future promises of being green cannot be made unless there are some specific plans to achieve those claims.

Manisha Kapoor, CEO and secretary-general, ASCI said, "It is necessary that consumers have the correct information to make informed choices to support green products. It is also important that organisations that genuinely provide greener products are able to communicate this clearly to consumers. The Government too has expressed their concern on greenwashing or false green claims, and we believe that these guidelines are a significant step towards promoting transparency and accountability in environmental/ green claims made in advertising."

Greenwashing violates Chapter I of the ASCI Code on misleading advertisements.

Committed To Safe Use of GM Crops with Robust Evaluation System: Govt To SC

Bhavini Mishra: Business Standard Jan 18 2024

The government told the Supreme Court on Wednesday that it was committed to the safe use of genetically-modified (GM) crops and "accordingly robust evaluation systems are in place". Bt cotton was approved in 2002 after an elaborate safety-assessment exercise spanning over seven years, the Centre said.

The court is hearing public interest litigations challenging the environment ministry's decision to approve the commercial cultivation of GM mustard.

This is the first time that a GM food crop is set to be commercially cultivated. On the third day of hearing, the Centre told the apex court that India has a robust regulatory framework in place for the regulation of genetically-modified organisms (GMOs) and products thereof.

"The approval to Bt cotton and Bt brinjal by Review Committee on Genetic Manipulation (RCGM) and Genetic Engineering Appraisal Committee (GEAC) has been accorded on the basis of an elaborate set of guidelines and procedures. These guidelines are based on state-of-the-art international guidance developed after years of consultations by agencies like FAO, WHO, OECD and Codex Alimentarius," the government said in its filing.

The court, on January 11, had expressed displeasure at the GEAC for not considering recommendations of the court-appointed Technical Expert Committee (TEC) before taking its decision in October 2022 to release the GM mustard variety into the environment. The TEC had made certain recommendations, with one member dissenting.

The Centre, represented by Attorney General for India R Venkataramani, had told the court that the GEAC had not considered the committee's report as there was no legal requirement for it to consider such reports. It should be noted that the release of the GM Mustard was put on hold after the Court asked the Centre to maintain status quo in November 2022.

The Centre also said that the regulatory mechanisms have not faltered and acted in a most transparent manner. "In fact, all the data, reports and decisions, have been made available on the website for information of the public," it said. The GEAC functions under the ministry of environment, forests and climate change.

During the hearing, the Bench of Justices BV Nagarathna and Sanjay Karol said one can have different schools of thought and judges cannot enter into a debate with scientists. "We have to consider what is good for India," Justice Nagarathna said.

Advocate Prashant Bhushan, appearing for one of the petitioners, said their concern is the irreversible risk of contamination that the country faces if environmental release of GMOs is permitted. This is in light of the fact that the safety of GMOs has not been established for the health of humans, livestock, environment, biodiversity and unintended consequences.

"Further, the TEC has pointed out the adverse consequences that arise due to use of GMOs and studies demonstrating the risk to human health, environment, & biodiversity. The Union of India is silent as to the measures it will put in place to ensure that there is no contamination of the fields of farmers," he told the court.

Exploring How Consumers Define 'Healthy' Through Dietary Patterns

By Deniz Ataman 02-Nov-2023 – Food Navigator USA

Consumers' relationship with food continues to evolve through diets that target more specific needs while simultaneously shifting how they define healthy, according to results from the International Food Information Council (IFIC) Food and Health survey.

Approximately 50% of Americans have followed an eating pattern or diet in the past year, including high-protein (18%), mindful eating (17%), calorie-counting (12%), clean eating (12%) and intermittent fasting (12%), highlighting consumers' focus on personalizing their health habits.

The report found that among the top reported motivators for adopting a new eating pattern or diet, losing weight (43%) was the highest, followed by wanting to improve physical appearance (39%) and protecting long-term health and preventing future conditions (33%)—in contrast to 2022, the 34% wanted to lose weight and 31% wished to improve their appearance, demonstrating that consumers are taking their health more seriously.

Within age groups, younger generations are now more likely to follow a specific diet or eating pattern than Baby Boomers, who were the most likely generation to do so in 2022. When defining healthy food, “fresh” and “low in sugar” were reported as the top two definitions (40% and 37%, respectively) while “minimal or no processing” and “low in saturated fat” were ranked the lowest (23% and 21% respectively), which opens an opportunity for CPG manufacturers to formulate products that meet consumers' health preferences on the label.

While consumers are defining healthy for themselves through diets and eating patterns, more than half of those surveyed reported they would buy the “healthy” option that’s defined by the FDA, highlighting the opportunity for more education on the relationship between food and health by nutrition policy experts.

Functional Claims Resonate with Consumers of All Ages, In-Store Marketing Activities Still Drive Trial, 84.51° Reports

By Ryan Daily
02-Nov-2023 – Food Navigator USA

Retail data firm 84.51° is out with its October Consumer Digest, highlighting differences between what younger and older consumers look for in better-for-you foods and beverages and how in-store marketing activities are generating new product purchases.

Per the report, younger consumers between the ages of 18-44 are more likely to look for general functional claims, while consumers between 44 and up are focusing more heavily on gut health-related, low calories, and clean ingredient claims. The young shopping demographic was more likely to seek out products with functional benefits (38%) compared to 31% of the older consumers. Similarly, 16% of those between the age of 18-44 sought out functional beverages, and 19% looked for non-alcoholic drinks, compared to 10% and 12%, respectively, for the older demographic.

For the older consumer demographic, 28% looked for products with high-fibre content, and19% of the younger demographic said the same. Older consumers also sought out products with healthy gut/digestive health claims at a higher rate, with 37% of them saying they look for these products, compared to 33% of those between the age of 18-44. The older shopper demographics were more likely to respond to clean ingredient and low-calorie claims, with 43% looking for products with clean ingredients and 35% for low calorie, compared to 36% and 28%, respectively, for the younger demographic.

Regardless of age, consumers are still largely finding new product to try in store, and shoppers will try a new product due to a price reduction. When asked how they find new products to try, 47% of consumers said in-store displays,45% product advertisements, 42% product coupons, and 41% from sales and promotions led to the discovery of new items.

Despite investments in the omnichannel shopping experience, 22% of consumers said social media, and 20% said a retailer website led to a new product purchase.

A majority of consumers (70%) would also try a new product if they saw a price reduction, while a similar 68% would purchase a new item with a coupon. On the low end of purchase drivers, 13% of consumers said a celebrity or influencer led them to purchase a new product.

India's New Local Language Food Safety Platform Hoped to Boost Compliance Among Domestic Food Firms

By Pearly Neo 15-Nov-2023 – Food Navigator Asia

The Food Safety and Standards Authority India (FSSAI) has launched a new version of its food safety platform in the local Hindi language in an effort to increase domestic food firm understanding and compliance of local regulations.

India has long been facing challenges with food safety compliance in the local food sector, with products such as alcohol and dairy often ranking high on the local most-adulterated products list. Local food safety authority FSSAI launched a food safety portal dubbed Food Safety Compliance System (FoSCoS) several years back, but this has primarily been operated in English, and smaller domestic businesses have had trouble navigating as a result.

FSSAI has recently launched a version of the FoSCoS in Hindi, hoping to attract more local food firms to utilise the portal. "Since its nationwide launch in 2020, FoSCoS has emerged as a single access point for food businesses and regulatory authorities across the country, streamlining all compliance-related activities, " FSSAI said via a formal statement. "It has played a pivotal role in the digital transformation of various food safety processes, simplifying adherence to regulatory norms for food businesses nationwide [and now] this Hindi language portal is a further significant leap. This will enhance user experience and accessibility, which is an important step towards enhancing business operational efficiency in the food industry."

With the small and medium food businesses that have trouble understanding English as a primary target for this locally-focused portal, FSSAI has plans to expand this local concept to include more local dialects in the future.

"The introduction of the Hindi version of FoSCoS [is aimed at] getting food businesses, entrepreneurs and stakeholders from diverse linguistic backgrounds to seamlessly access and leverage its services," the agency added. "There will also be more versions launched in other regional languages coming in due time, which will make it even more user-friendly for an even wider audience moving forward." There are 20 other regional languages in India besides Hindi, including amongst these Bangla, Kashmiri, Malayalam, Punjabi, Tamil, Telugu, Urdu and more.

FSSAI is attempting to tackle the local food safety issues from multiple aspects despite the many challenges faced, with this portal launch just the latest in a long string of initiatives to improve local compliance. Other attempts have included nationwide crackdowns and large-scale tests of food products, as well as mandating laboratory improvements. "There will be no tolerance for food adulteration in India," Union Minister for Health and Family Welfare Dr Mansukh Mandaviya declared earlier this year.

Unfortunately, India has a long track record of conducting such crackdowns and making such declarations over many years, but food adulteration has persistently remained a major concern locally.

Compliance has clearly been a major hurdle in making improvements, as can be seen from the most recent India State Food Safety Index published by FSSAI earlier this year that saw even its top performing states in terms of food safety still yielded low compliance scores –with a high score of just 18 out of 28 overall for top scorer Punjab. It is possible that this lack of compliance could be language-related, so it is certainly hoped that the launch of the local language platform will yield significant improvements in the area of food safety in India.

High Sodium Content in Condiments Poses Public Health Concern in China

By Shali S. 22-Nov-2023 – Food Navigator Asia

There is an urgent need for government-backed comprehensive reformulation programmes for high-sodium condiments in China, experts claim.

A recent study on common Chinese condiments highlights a significant public health concern: high sodium levels. When comparing Chinese condiments against the World Health Organization's global sodium benchmarks, chicken extract/chicken powder, bouillon cubes, and soy sauce are high in sodium, yet consumed often. Other commonly consumed condiments like sesame/peanut butter-based products are also excessively high in fat.

Chinese researchers emphasize the urgency of government initiatives to promote healthier dietary choices and improve public health outcomes. The study also highlights that the most important measure to improve the health of Chinese residents is to improve their awareness of dietary knowledge, so as to reduce dietary risks and control the intake of oil, salt, sugar/sweeteners, and other ingredients in the diet through condiments or other sources.

The objective of this study was to assess the nutritional composition of key condiments in China and provide essential data to support the establishment of recommended condiment intake levels for salt reduction initiatives in the country. Nutritional information for condiments was collected from the Chinese Database on Nutrition Labelling of Prepackaged Foods spanning the years 2017 to 2022, as well as through online access to food composition databases from France, the UK, Belgium, and Japan.

The study encompassed an analysis of 1,510 Chinese condiments and 1,565 comparable condiments from the four countries mentioned above. Cross-country comparisons were conducted to assess variations in nutrient content among the five countries concerning the World Health Organization's global sodium benchmarks.

The findings revealed that, among the various categories of condiments in China, products based on sesame or peanut butter exhibited relatively high energy, fat, and protein contents, specifically 2,580 kJ/100 g, 50 g/100 g, and 22.2 g/100 g, respectively. Additionally, certain condiments, such as chicken extract, bouillon cubes, and soy sauce, were found to have elevated sodium levels. Substantial disparities in energy and key nutrient levels were observed across different condiment products when compared to similar products in other countries.

In light of these findings, the study concluded that it was imperative to enhance public awareness regarding condiment consumption and reduce the quantity of condiments consumed. This holds significant implications for lowering per capita salt intake in China and promoting overall health. The researchers also urged governments to encourage reformulation programme, which are especially important due to the adverse effects of consuming high levels of sodium, fat, and sugar in a daily diet.

Limiting Front-Of-Pack Nutrition Labelling to Added Sugar, Saturated Fat & Sodium Could Skew Potential Health Impact, Stakeholders Tell FDA

By Elizabeth Crawford 27-Nov-2023 – Food Navigator USA

Front of package nutrition labelling intended to help consumers select healthier foods and beverages by potentially calling out the amount of added sugar and other nutrients of interest could unintentionally expose children to higher levels of non-nutritive sweeteners, a public health advocate warned earlier this month at a public meeting hosted by The Reagan-Udall Foundation for FDA.

Echoing the sentiment of many stakeholders from across the value chain gathered virtually Nov. 16, Frances Fleming-Milici, director of marketing initiatives for the Rudd Center for FoodPolicy & Health, voiced her support for front of package nutrition labelling, which FDA is exploring as part of the White House's National Strategy to end hunger and increase healthy eating and physical activity by 2030. Beginning in 2022 with focus group research that was followed by an experimental study and additional focus group research in 2023, the FDA is testing how best to provide at-a-glance nutrition information, potentially including levels of added sugar, saturated fat and sodium, on the front of packs to help consumers "quickly and easily identify foods that can help them build a healthy eating pattern," according to the agency.

Fleming-Milici said at the public meeting that the Rudd Center for Food Policy & Health believes FOP labelling can "effectively communicate information about a food's nutrient content, if it contains nutrients of concern and is standardized in colour and location is mandatory and contains a graphic component." But she also warned of "unintentional negative consequences." Specifically, she cautioned, "FDA strategies to reduce added sugar consumption coupled with mandatory front of package disclosures on products high in added sugar will likely result in reformation … and in increase of non-nutritive sweeteners in foods and beverages."

Of particular concern, said Fleming-Milici, "is how this impacts children." She explained that "experts" recommend against children's consumption of non-nutritive sweeteners, and yet "among children in the US over 20% … aged two to five consume non-nutritive sweeteners in the foods they eat." She added, "there is a potential for this number to rise" if added sugar is included in mandatory front-of-pack labelling and manufacturers reformulate with alternative sweeteners to reduce sugar levels and obtain labelling that appears healthier to consumers.

For support, she pointed to Chile where a front of packaging warning label was adopted for added sugar but not for non-nutritive sweeteners and where, she said, "there has been an increase in the presence and consumption of non-nutritive sweeteners in beverages, yogurts and other products consumed by children." She added a similar trend is already happening in the US, where, for example, 16 of the 21products and flavours offered by Capri Sun in 2022 included non-nutritive sweeteners to help lower overall added sugar content.

"Therefore, we urge the FDA to consider in the near term the importance of adding disclosures about non-nutritive sweeteners to foods and beverages to avoid unintentional negative consequences of policy change," she added that recently published research by The Rudd Center for Food Policy and Health shows FOP disclosures of added sugar and non-nutritive sweeteners significantly increased parents' ability to identify these in products.

Several stakeholders at the meeting also urged FDA to include calories and other nutrients of interest on FOP labelling. Calories were included in potential schemes tested by FDA in focus groups in 2022, but appear to have been dropped by the agency in its experimental study this year, based on data presented at the meeting. The schemes tested this year zeroed in on the amount of saturated fat, sodium and added sugar both as a percentage of daily value per serving and with a characterization of low, medium or high along with green, yellow and red traffic light colour coding.

"We believe meaningful discussion on consumer guidance must include calories," argued FMI– The Food Industry Association at the meeting. "Calories are prominently bold in the updated Nutrition Facts label and required on menu labelling and vending. Yet, none of the front-of-pack schemes tested has calories included," said Krystal Register, senior director of health and wellbeing at FMI, which co-created the Facts Up Front voluntary labelling program, which is widely used and includes calories.

The Consumer Brands Association agreed that FDA should test calories in FOP schemes "as research has shown that calories are what consumers look for most often on nutrition labels," and FDA's "stated goal to reduce diet related chronic disease can best be achieved by giving consumers calorie information as part of any FOP scheme," Sarah Brandmeier, director, regulatory and technical affairs at Consumer Brands Association, said at the meeting. She also noted, "a calories icon would provide a relevant practical option for small packages where complete FOP graphic is not feasible."

Including calories also would better align with regulatory requirements for products sold in vending machines – as would creating alternative designs for smaller pack sizes, like those sold in vending machines or as "treats," added Farida Mohamedshah on behalf of the National Confectioners Association. Mohamedshah explained that many confectionery products are sold in smaller portion packet sizes to help consumers manage sugar intake, which "raises space concerns to accommodate the required FOP labelling. Therefore, we urge the agency to consider the application of FOP on small packs and in these cases offer alternatives to provide this information."

While FDA focused on saturated fat, sodium and added sugar in its most recent round of tests for FOP labelling, not all stakeholders agree those are the best choices. For example, CBA's Brandmeier advocated for a more "holistic approach to the labelling for a food nutritional profile, including addressing both positive nutrients and nutrients to limit –allowing consumers to make more informed choices bases upon the total nutrient contributions of a food." She argued, "an exclusive focus on nutrients to limit will not help consumers identify the better or more nutrient dense choice."