

food MARKETING & TECHNOLOGY इंडिया

INGREDIENTS

14

**DAIRY: A NEW
ERA OF INNOVATION**



FOOD PROCESSING

PROCESSING

30

**ULTRASOUND
TECHNIQUE IN
FOOD PROCESSING**

PACKAGING

38

**MONO MATERIAL
DEMAND IN FOOD
PACKAGING**



Healthy & Convenient Packaging

When two different trends come strong at the same time, it is tempting to look for links between them. For example, health and wellness is a major hot topic worldwide, and all the talk of climate change or sustainability – and there is a lot of it – concerns all aspects of packaging, which are outside and inside.

The link is the customer. Today's consumer is far better informed than ever before. She is more likely to ask questions about healthy and functional products. Especially as the average population is getting older, people often suffer more from health problems, which can be treated, prevented or at least eased through positive nutrition. People want and deserve convenience.

In packaging the same is true. A better quality of life is when packages can be easily opened, easily closed and which will keep the product good for as long as it is needed. This seems fairly straightforward, until you realise that people also want to save money. So they buy bigger packages, which then have to last longer and need to be resealable. In Europe more people live alone now than at any time in the past. Single households bring other challenges to the packaging industry.

Convenience cannot be at the expense of quality or attractiveness, rather it is a trend which encompasses the whole industry and applies equally to raw materials, final products and their presentation.

Suppliers of health and wellness products want to sell as much as possible. Packaging can help here too. Because nutraceutical products are different, they need different packages. They need to give a feeling of well-being and security. Consumers will pay a premium for such products and they rightly expect a premium pack. Poor printing or damaged corners gives a feeling of bad contents.

Convenience, wellness and health are current developments in society which are influencing packaging. Functional foods are now mainstream products – and they need functioning packages to support them.

Sincerely

Benno Keller
keller@harnisch.com

Ian D. Healey
healey@harnisch.com

Dear Readers,

The food industry has shown many positive sides during the lockdown period in India. Food retailers and beverage industry have shifted their normal operating business techniques to consumer-friendly ways of reaching the end-user. Take-home or home-delivery methods have taken a wider arena of the retail business than ever before. This situation has also translated to safety packaging and contactless delivery by many brands such as Dominos. This measures have significantly assured safety and hygiene in the food packaging industry to be taken as a crucial stage for safety of the consumers. Like everything is chained to one another, the food industry has adopted various technologies where the equipment is frequently sanitized to reaching the hand of the end-user, invariably testing each step of the way.

It is heartening to see that many other industries have been hit hard due to this prolonged lockdown period.

In this edition you will find a report on Mintel's webinar - 'consumer's trends shaping India's biscuits and cookie category'. This is an insightful reportage and will be useful for manufacturers in this category.

We have included two powerful interviews with Mr Piyush Pattnaik, the MD of Cargill Foods and Mr P Chandra Shekhara Reddy, Vice President Sales & Marketing of Freedom Healthy Cooking Oils in this edition. They have shared insights on their relaunch and healthy cooking oil choices; their strategies to grow and overcome the challenges posed by impeding COVID-19.

However, there are plenty technical articles written by the industry stalwarts.

We are leaving you with much more to relish on.

For regular updates do visit www.fmtmagazine.in

Linda Brady Hawke

Contents

November 2020

Food Safety Q & A

- 10 Food Safety Helpline answered the following queries raised on its platform

Ingredients

- 10 Barista Toppings: Influence of Alpha- Cyclodextrin on the Foaming Properties of Dairy and Plant-Based Systems
- 14 Dairy: A New Era of Innovation
- 20 Dragon Fruit: A 'Crazy' Seeming Fruit Has a Powerhouse of Uses
- 23 Herbal Tea: A Miraculous Drink
- 26 New Flavours and Trends in the Chocolate Industry



Processing

- 28 New World-Class Potato Processing Line for Bem Brasil
- 30 Ultrasound technique in food processing
- 34 Sensory Evaluation: BIS way

Packaging

- 38 Mono Material Demand in Food Packaging
- 40 Packaging of Frozen Food



Interview

- 43 Vice President Sales & Marketing at Gemini Edibles & Fats
- 46 Managing Director at Cargill Oils

Webinar

- 48 Consumer preferences shaping the post-pandemic bakery industry



Mother Dairy Evokes Fond Food Memories in latest Campaign Focussing on Ghee

Mother Dairy has rolled out a new campaign #Khushboo Apnepan Ki, focussing on Ghee. The newly-introduced campaign is aimed at evoking nostalgia and stimulating togetherness this winter season. The campaign strives to take consumers down memory lane, reminiscing fondly of their favourite dishes cooked by their near and dear ones with loads of love, especially using ghee as an ingredient. The three-month long campaign will be showcased across print, digital, radio and outdoor mediums, and is targeted to create awareness and enhance brand affinity amongst its consumers in Delhi NCR, while creating a distinct value proposition.

The company has chosen its Ghee as the protagonist in the campaign, highlighting a very important and defining characteristic trait of high-quality Ghee, that is, its 'aroma'. The central idea of the new campaign revolves around the distinct aroma of food that is prepared with pure and quality ghee, which provides a sensorial stimulus and triggers warm and endearing memories of home and of the loved ones. The articulation of this three-month long campaign is a testament to those fond food memories from one's life.

Sanjay Sharma, business head, dairy

products, Mother Dairy, said, "Mother Dairy, a caregiver brand is known for stimulating togetherness, the brand bonds people over good food. It is often said that the taste and aroma of food prepared with Ghee triggers fond associations and memories. For instance, things like the nostalgia of maa ke haath ke bane khane ki khushboo often overwhelms us emotionally. In today's scenario we yearn for these memories of the sweet & simpler times with our loved ones. Our campaign idea, 'Mother Dairy Ghee, Khushboo Apnepan Ki', was thus derived from the amalgamation of this consumer insight and our overall brand idea – Mother Dairy, Rishton ka Swad Badhaye."

The articulation of the overall positioning proposition of the company's value-added dairy products portfolio – 'Rishton Ka Swad Badhaye' – is a testament to the fact that the company's dairy products offers you the quintessential delightful refreshing taste that prolongs the time spent with friends and loved ones. It revolves around the central thought of good food has a profound effect on people and highlights that there is a caring and comforting thing about food that makes spending time with family and friends much more special and endearing. The company strives to

bring these values to its consumers through its range of healthy and delightful dairy products.

"The Ghee category itself has always been our strategic focus as it is traditionally linked to our food habits and is accepted across generations. Also, with the festivities around and winters gradually setting-in, ghee consumption increases across markets. To take this cue of our overall positioning ahead, we wanted to further strengthen the intrinsic bond of relationships coupled with food, across our product categories, hence, we opted to execute the campaign for such a category at this point. Through our new campaign, we intend to build a distinct proposition for Mother Dairy Ghee, dial up the brand trust and core proposition at a deeper level to engage our consumers in Delhi NCR," added Sharma.

The ghee is pure, rich in vitamin A and is completely harmful trans-fat free, that means it has no industrial trans-fat which causes harmful effects to the body. It is made up of short chain fatty acids. These short chain length of fats in foods affects their intestinal absorption and thus absorption of ghee in body becomes easy. The ghee in moderation along physical exercise and healthy lifestyle can be beneficial. It is available across 12,000 outlets in Delhi NCR.

Dr. Oetker to Purchase Online Drinks Delivery firm Flaschenpost

Dr. Oetker has signed an agreement to acquire Flaschenpost, a German online beverage delivery service, for an undisclosed sum.

With the acquisition, Dr. Oetker aims to enhance its existing

online beverage delivery service Durstexpress, which belongs to its Radeberger Group unit.

Based in Münster, Flaschenpost was established in 2016 and currently delivers beverages including water and beer across 22 German cities.

While Durstexpress operates primarily from Berlin and the eastern provinces, Flaschenpost provides drinks from North Rhine-Westphalia.

Upon completion of the deal, the new expanded delivery service

will be managed and developed from two central administrations in Berlin and Münster.

It will be managed by a board consisting of members from

the management of both Flaschenpost and Durstexpress.

The transaction is subject to approval by the antitrust authorities

McDonald's to Debut Line of Plant-Based Meat Options in 2021

McDonald's has announced that it is developing its own line of plant-based meat alternatives called McPlant, including a plant-based patty.



The announcement was made by company executives on yesterday's post-earnings conference call, after its comparable sales continued to improve globally in its third quarter.

McDonald's said its McPlant line could include burgers, chicken substitutes and breakfast sandwiches, which it expects to test in some markets in 2021.

The fast-food chain is yet to announce which suppliers it will use in the crafting of its McPlant line. Meanwhile, a Beyond Meat spokesperson has claimed that it co-created the McPlant patty, as reported by Reuters.

This would not be the first time the two companies have collaborated, as McDonald's partnered with the meat alternative brand last year to conduct a trial of PL.T – which was made with a Beyond Meat patty – in Canada last year.

McDonald's is one of the few fast-food chains yet to sell plant-based meat burgers on a permanent basis, following the likes of Burger King, White Castle and Dunkin' Brands.

According to Reuters, the move could be the biggest and would put the plant-based meat movement at the forefront in mainstream America.

In its blog, McDonald's said: "There are other plant-based burgers out there, but the McPlant delivers our iconic taste in a sink-your-teeth-in (and wipe-your-mouth) kind of sandwich. It's made with a juicy, plant-based patty and served on a warm, sesame seed bun with all the classic toppings."

Zak Weston, The Good Food Institute foodservice and supply chain manager, added: "When McDonald's does something, they do it deliberately and at a massive scale. For a chain of their size to launch a new plant-based item leveraging their iconic 'Mc' branding, it means they see real and sustained demand and they have an assured supply chain."

GEA to Divest two Companies Under its Farm Technologies Division

GEA has signed an agreement to sell its barn equipment and milk cooling technology businesses to private equity firm Mutares for an undisclosed sum.

Until now, the companies have been part of the group's farm technologies divisions. They include GEA Farm Technologies Japy, a French manufacturer of milk cooling tanks, and Royal De Boer Stalinrichtingen, a European supplier of barn equipment based in the Netherlands.

GEA says the divestiture is in line with its strategic portfolio optimisation and will enable its farm technologies division to focus on automation and digitalisation of milking installations and processes, as well as on products that ensure milk quality and improve cow health.

Together, the two companies reportedly generated revenues of approximately €50 million in 2019.

Following the transaction, GEA will retain access to the product

portfolio of both divested companies to continue serving individual customer needs.

"We are pleased that Mutares will become the new owner of both companies, as Mutares is in a position to develop each company's business potential to the best possible extent," said Stefan Klebert, CEO of GEA.

The transaction, which is subject to merger control approval, is expected to close in December this year.



FoodSafetyHelpline.com



Food Safety Helpline answered the following queries raised on its platform

Q We manufacture products exclusively for export. These are both traditional food items like rice cereals etc. and proprietary food items.

I seek clarification on:

- 1. Do I need to take product approval for these export items as well?**
- 2. Whether FSSAI license no. is also required on label of these export items or not?**

100% Export oriented food units shall have to acquire a Central License from FSSAI under Food Safety & Standards Act, 2006.

Food Product Approval System no longer exists as per the Hon'ble Supreme Court order wide date 19.08.2015. FSSAI has revised the definition of Proprietary Foods in the Ninth Amendment of FSS (Food Products Standards & Food Additives) Regulation 2016. So, various food products which were earlier requiring the product approval can now be considered as standardized food products if they comply with the definition of Proprietary Food.

FSSAI also notified the Food safety and Standards (Food or Health supplements, Nutraceuticals, Foods for special dietary uses, Foods for medical purposes, Functional foods and Novel foods) Regulations, 2016 and Food Safety and Standards (Food Product Standards and Food Additives) Seventh Amendment Regulations, 2016 relating to Harmonization of Food additives. Link: https://www.fssai.gov.in/upload/uploadfiles/files/Nutraceuticals_Regulations.pdf

If your food product/s still not covered under the aforementioned regulations then you have to apply

for the prior approval from FSSAI as specified under Food Safety and Standards (Approval for Non-Specific Food and Food Ingredients) Regulation, 2017. Link: https://www.fssai.gov.in/upload/uploadfiles/files/Gazette_Notification_NonSpecified_Food_Ingredients_15_09_2017.pdf

The Food Labelling will be as per the requirements of the buyer & his country. So, the information on the label and how it should be displayed will have to be as per the guidelines of the importing country.

Q What is the rule about shift code in batch code?

- 1. Can we write G (General shift) for production started from 7AM to 5 PM.**
- 2. Can we write A (Morning shift) for production after 2PM upto 5PM**

The Batch No. & Code number are used for the identification purposes so, how should these be displayed on the label will depend on your own choice. You need to follow the guidelines as defined under Food Safety and Standards (Packaging and Labelling) Regulation, 2011 and the respective amendments.

Q What is the Penalty in case of conducting food business without a license?

As per the FSS Act 2006 (Section 63); If any person of food business operator manufactures, sells, stores or distributes or imports any article of food without a license would be liable for a fine which may extend to Rs. 5 Lacs and an imprisonment which may extend to Six months.

A food business without a Registration would be liable for a fine which may extend to Rs. 2 Lacs.

Q Is it essential for a small Coffee Roasting company to have a staff member who has a B.Sc. degree? Will an engineering degree do?

As per one of the conditions of the license, such staff member shall possess at least a degree in Science with Chemistry/Bio Chemistry/Food and Nutrition/Microbiology or a degree or diploma in Food Technology/Dairy Technology/Dairy Microbiology/Dairy Chemistry/ Dairy Engineering/ Oil Technology or any degree or diploma in any other discipline related to the specific requirements of the business from a recognized university or institute or equivalent.

Q We are planning to start e-commerce/e-tailing for Sweetmeat/Biscuits/Namkeen through our own web-portal being developed for this purpose. I need to know what are the registrations/licences and other formalities required if;

- (A) goods being e-tailed belong to other retailers/distributors/manufacturers**
- (B) goods being e-tailed belong to other retailers/distributors/manufacturers but are re branded/re packed by us**
- (C) goods being e-tailed are manufactured by us.**

FSSAI has published the guidelines for E-commerce FBOs and the following points for your reference:

- E-commerce entities providing listing services to sellers, brand owners, manufacturers, restaurants on their platform, thereby providing platform for commerce to the sellers, manufacturers, restaurants etc. may not be required to obtain a license but the following must be taken care of:

1. misleading information/ false claims pertaining to the sellers/ brand owners, vendors, importers or manufacturers, or
 2. misleading images of food products made available or shown on their platform
- Sellers, brand owner, manufacturer, vendors, importers, processors, packagers or manufacturers who display or offer their food products, including food services, catering services, sale of food or food ingredients for sale to the customers, through either the market based model or the inventory based model of e-commerce shall have to obtain a license from the Central Licensing Authority.
 - Operating and providing storage and or distribution services to the sellers, brand owners, vendors, importers or manufacturers of the food products listed on their marketplace shall have to obtain a license from the Central Licensing Authority.
 - Providing transportation services to the sellers, brand owner, vendors, importers or manufacturers of the food products and/ or providing last mile delivery transportation to the end consumers shall have to obtain a license from the Central Licensing Authority.

Besides above, the licensed FBOs shall have to comply with the required guidelines as specified under FSS Act, Rules & Regulations..

Q Can we use artificial colour in Pan Masala?

No, they are not allowed to be used. Only permitted natural colors can be used in Pan Masala.

Barista Toppings: Influence of Alpha-Cyclodextrin on the Foaming Properties of Dairy and Plant-Based Systems

■ By Dr. Ulrike Fischer-Nägele, Yvonne Haslauer

Capuccino (espresso with milk foam), latte macchiato (espresso with foamed milk and warm milk layers) and Asian bubble tea (tea with pearls and topping) are becoming more and more popular as new lifestyle products. The resulting coffee and tea-based beverages use aerated/foamed toppings, which must develop a fine, smooth foam with substantial volume and satisfactory stability over time. These food products are made either fresh in food service restaurants, by the consumer at home or in vending machines; nearly all types of these applications involve the use of either liquids or powder premixes. In addition to resistance to drainage, coarsening and foam collapse, another highly valuable property in toppings such as these is a smooth, creamy mouthfeel. While research aimed at understanding and optimizing the corresponding mechanisms in dairy foams has a long history, increasing demand for vegan diets requires the same properties for plant-based toppings as well.

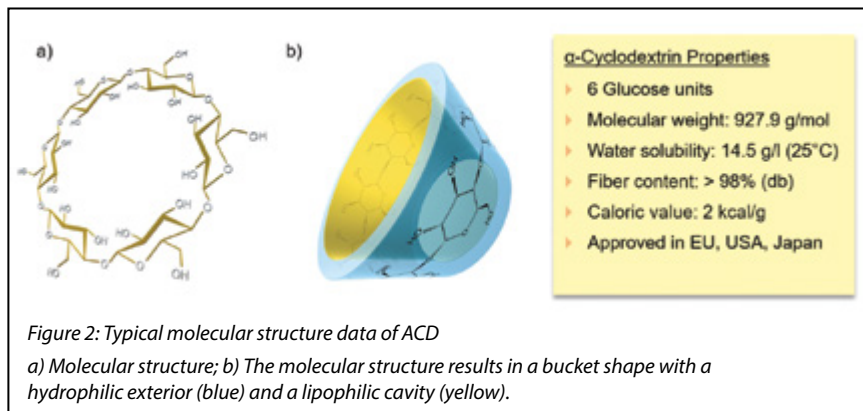


Figure 2: Typical molecular structure data of ACD
a) Molecular structure; b) The molecular structure results in a bucket shape with a hydrophilic exterior (blue) and a lipophilic cavity (yellow).

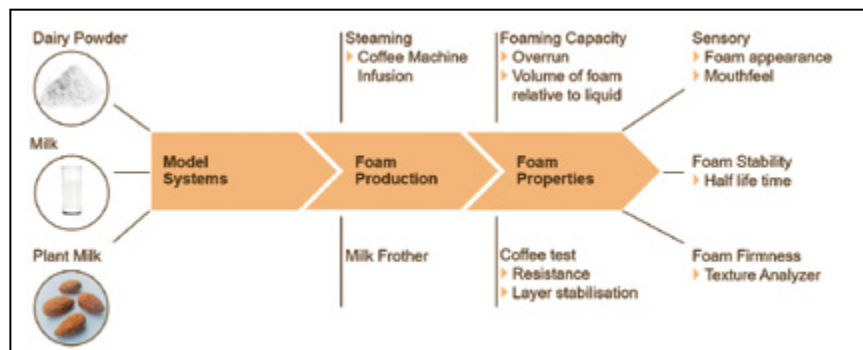
The Technical Service Unit of the Nutrition Team at WACKER has explored the beneficial impact of alpha-cyclodextrin (ACD) on various foam properties in different model systems (Figure 1).

Dairy powder: powdered dairy and non-dairy toppings varying in fat content; milk: UHT milk varying in fat content; plant milk (in this case almond milk with 2.5% almond content). Foam was produced either by infusing steam through a coffee machine or through the use of a milk frother. Various properties

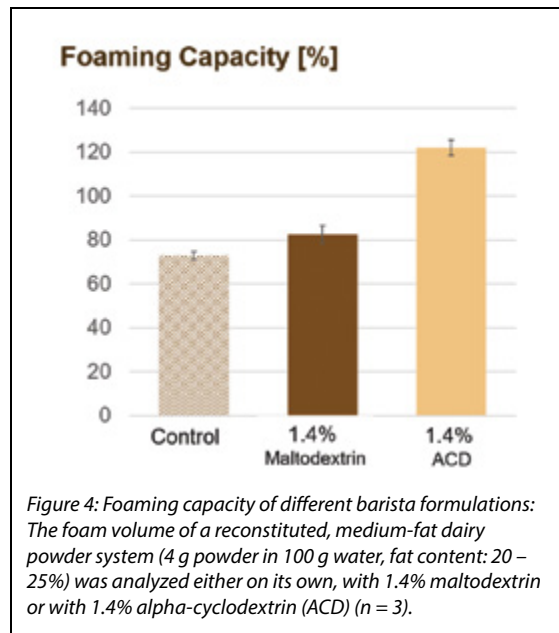
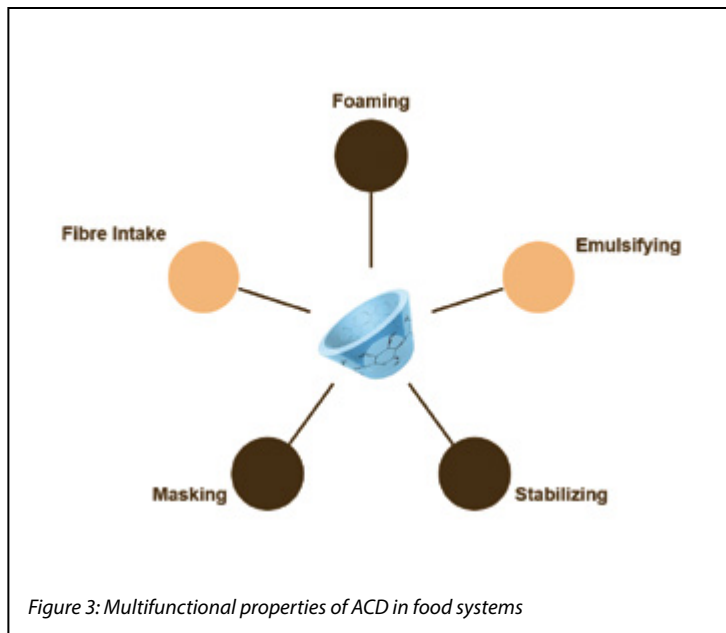
of the resulting foam were then analyzed.

Alpha-cyclodextrin is a ring-shaped oligosaccharide based on 6 glucose units, which is produced by WACKER BIOSOLUTIONS in a patented fermentative process based on starch, a renewable raw material. WACKER markets ACD under the brand name CAVAMAX® W6. Its unique molecular structure and three-dimensional interactions give the molecule an internal lipophilic area (referred to as the “cavity”) and an external hydrophilic area (Figure 2).

Figure 1: Model systems tested, foaming processes and foam properties



Due to this highly unique molecular structure, ACD has a huge variety of properties (Figure 3) that can be used in multiple food applications. The hydrophobic inner cavity of ACD allows other lipophilic molecules to form host-guest inclusion complexes through non-covalent interactions. The spontaneous interaction of ACD with triglycerides at the oil-water interface of food systems gives ACD-TG complexes



emulsifying properties (“emulsifier-in-situ”). Hydrogen bonds between the exterior part of ACD and long-chain molecules, such as proteins or polysaccharides in food ingredients, make the system more viscous and therefore positively influence the foaming/whipping properties of the food matrix. As an additional beneficial consequence, the various interactions of ACD also stabilize the desired food matrix.

Regarding the specific application of barista toppings, an evaluation of various examples of the model systems in this study shows that ACD significantly improves foaming capacity, i.e., the amount of foam achieved in such systems could be increased substantially, as shown in Figure 4.

The addition of 1.4% ACD nearly doubled the overrun. The same amount of an inert linear oligosaccharide (maltodextrin) was used as a direct comparison. Maltodextrin caused only a slight increase in the overrun, due to the increase of dry matter – not

comparable to the significant increase in foaming capacity achievable by the presence of ACD.

Adding ACD to barista toppings not only improved foaming capacity – the stabilizing effect of CAVAMAX® W6 in the foam also retarded foam degradation reactions (Ostwald ripening, drainage, coalescence, deformation and bubble creaming) and therefore positively influenced foam stability in these toppings.

Figure 5 shows the increase in foam stability for the model dairy and non-dairy powders (fat content 50-60%) reconstituted from 4 g powder in 100 g water: the addition of ACD increased foam stability even at low dosage rates, extending the foam half-life-time (the time it takes for the foam volume to shrink by half) from 3 to 15 minutes – this will enable a longer serving time with appropriate foam appearance.

Barista products are luxury lifestyle products. This means that, in addition to the volume and stability of the foamed topping, consumers

CYCLODEXTRINS ARE ALSO KNOWN FOR THEIR POTENTIAL TO MASK UNDESIRABLE FLAVORS IN VARIOUS MATRICES.

also place a great deal of importance on the overall impression: the appearance of the foam should be nicely creamy and homogenous. Figure 6 demonstrates the positive effect of 1% ACD in an almond milk foam (UHT almond milk with 2.5% almond content). For the consumer, this homogenous, creamy pore structure correlates to a full-bodied beverage and an improved mouthfeel – especially in plant-based barista toppings, which often need an additional boost in that regard.

The sensory evaluation of almond milks by a professional taste panel (n = 18 panelists) confirmed in a blind triangle test (DIN ISO 4120) that 12

out of 18 panelists prefer the almond milk with ACD (see Figure 7). The pure almond milk was described in the following terms: watery, no body, nutlike, bitter and astringent. The milk containing ACD, on the other hand, was characterized as having more body, less bitterness, improved creaminess and better mouthfeel.

Cyclodextrins are also known for their potential to mask undesired flavors in various matrices. As part of this study on the influence of ACD in barista toppings, this masking effect was demonstrated to either balance the cooking off-taste of dairy liquid systems and to cover/trap the rancid off-notes of the vegetable fat fraction of non-dairy powder systems. It also reduced the partial astringent or bitter note of almond milks – for other plant-based milks (those based on legumes such as soy or pea), the typical “beany” profile is a major concern and has to be balanced for consumer acceptance.

WACKER responded to the challenges of food technologists by developing barista products with convincing foam properties for the consumer. This involved controlling for various parameters, such as the type of raw material (seasonal variations), the foam generation method and processing, and adapting accumulated expertise from dairy systems to plant-based (vegan) matrices.

Three model systems were used (milk: UHT milk of varying fat content; dairy powder: different types of dairy and non-dairy powder systems of varying fat content; and plant milk: UHT almond milk with 2.5% almond content). In variations of these systems, alpha-cyclodextrin (CAVAMAX® W6) significantly improved the specific properties of barista foam toppings.

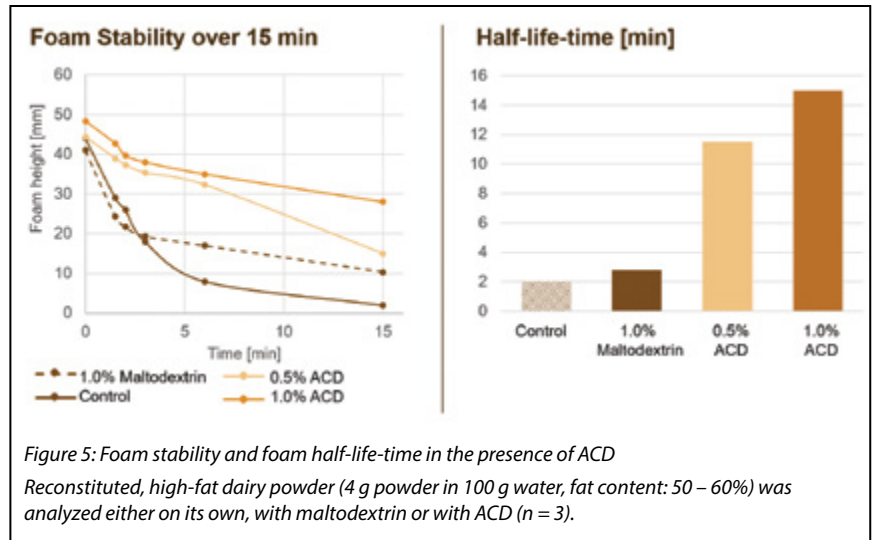


Figure 5: Foam stability and foam half-life-time in the presence of ACD

Reconstituted, high-fat dairy powder (4 g powder in 100 g water, fat content: 50 – 60%) was analyzed either on its own, with maltodextrin or with ACD (n = 3).

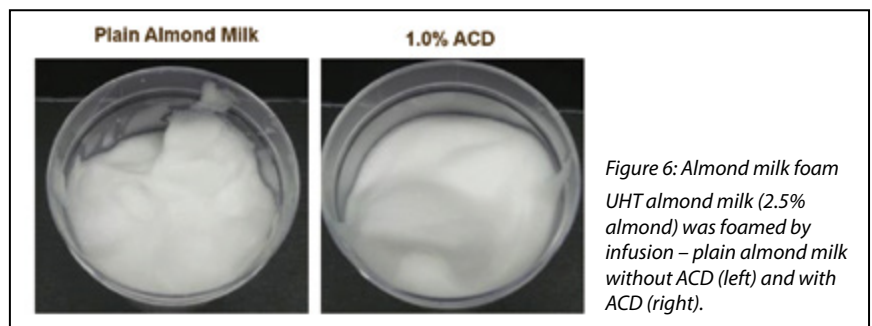


Figure 6: Almond milk foam UHT almond milk (2.5% almond) was foamed by infusion – plain almond milk without ACD (left) and with ACD (right).

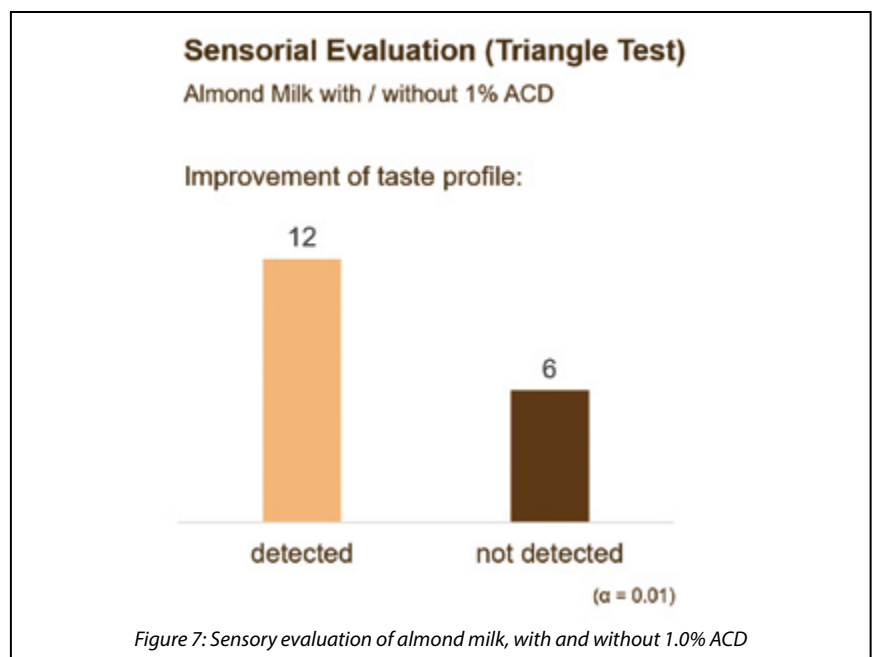


Figure 7: Sensory evaluation of almond milk, with and without 1.0% ACD

Dairy: A New Era of Innovation

■ By Lorraine Kelly

Although most countries produce milk products, the structure of the dairy industry differs across the globe. Many major dairy-producing countries consume most of their output internally, while others (for example New Zealand) export a large percentage of their production. Local consumption is often in the form of liquid milk, while the bulk of international trade is in processed dairy products such as milk powder.

The dairy industry is constantly evolving. To meet changing consumer desires, dairy companies are developing products with novel ingredients and flavors to maintain interest and offer new experiences. There is also a clear movement in some countries towards dairy-free alternatives, particularly plant-based products. 'Flexitarians' – those who follow a mostly vegetarian diet with some consumption of animal products – are a key driver of the plant-based trend and represent a significant opportunity for the food industry. Substantial investments in research and development (R&D) for

novel dairy alternative products are also driving growth of this market, and consumers are coming to expect improved dairy-like textures and flavors.

In this article, we discuss the changing dairy and dairy-free markets, particularly focusing on the regions leading the way in plant-based innovation, such as the US, and where the dairy market is growing, namely developing regions including South America, the Middle East and Africa, and Asia.

GLOBAL DAIRY TRENDS

According to the Organisation for Economic Co-operation and Development (OECD) and the Food and Agriculture Organisation (FAO) of the United Nations Agricultural Outlook 2019-2028, India is the largest producer of milk globally, and China is the world's largest importer of dairy products, especially whole milk powder.¹ The Asia Pacific (APAC) region is the dominating market for dairy ingredients, with its growth in recent years attributed to a high population and increase



in purchasing capacity. Growth is particularly fast in Southeast Asia, with many foreign dairy companies investing in Indonesia. Although the APAC market is the fastest-growing for dairy, adoption of plant-based dairy alternatives lags considerably behind the rest of the world. In terms of plant-based alternatives to milk is commoditised in APAC, but interest has waned in regions such as the US due to possible health and environmental concerns around soya beans.

In the West, overall per capita demand for fresh dairy products is declining in Europe and North America¹, but trends such as increased consumer interest in skin and gut health are driving innovation from dairy companies. For example, dairy drinks with ingredients such as turmeric, collagen and fermented kefir are joining probiotics as quick health kick products.

Health is also thought to be higher on the consumer agenda in recent months due to the 2020 COVID-19 pandemic. A report from Mintel suggests that dairy will offer affordable nutrition to those looking to boost their immune system during these times of uncertainty, and



beyond.² A generally more health-conscious global population, paired with forecasted economic recession, provides dairy companies with an opportunity to offer inexpensive nutritious dairy products that many see as 'comfort' foods. For example, the National Health Commission of China has proposed 'Guidelines for the Prevention of COVID-19', which recommends a daily intake of 300g of milk.

A WORLDWIDE VIEW OF PLANT-BASED PRODUCTS

Walking into most large supermarkets, it is hard to miss the growing presence of dairy alternative products – primarily milk alternatives. Plant-based alternatives to milk are the main substitute for regular milk, made from pulses like soya; cereals such as oats, wheat and rice; and nuts including almond, cashew, coconut and hazelnut. According to Reports and Data, the dairy alternatives market will reach \$41.8 billion by 2026, growing at a CAGR of 12.2%, with the APAC market holding the largest share in 2018,³ owing to its tradition of milk alternatives.

Alternatives to milks are not the only plant-based products receiving considerable attention from across the world. Dairy-free yoghurt and ice cream experienced strong growth in the last five years and are predicted to remain the fastest-growing categories – above milk alternatives (Figure 1).⁴ For example, some dairy manufacturers such as Danone are using the trend as an opportunity to add to their existing dairy brands.

Similarly to dairy, functional nutrition is playing a key role in this plant-based product development in numerous countries. In APAC, Europe and the Americas, brands are taking every effort to highlight inherent and added nutritional qualities of non-dairy food and drink. Single serving,



on-the-go plant-based products are providing consumers with the quick hit of vitamins and protein that they demand. The high protein claim continues to grow in Europe in the plant-based drinks, yoghurt, and ice cream categories, featuring in 10% of new product development (NPD) in the 12 months to March 2020.⁵

Although plant-based is a growing trend for now, its longevity as a diet is thought to be jeopardized by consumer 'self-entitlement' – the motivation is there to switch to a more sustainable diet, but many admit to struggling to sustain a dairy-free lifestyle and feel 'deserving' of including dairy in their daily diet. In fact, approximately one third of survey respondents said they would struggle to give up dairy, and that this is the barrier to them following a more environmentally friendly diet.⁶

PRODUCT INNOVATION

As manufacturers seek to improve the customer experience and become more consumer-centric, transparency across the supply chain is taking center stage. The dairy aisle is being reinvented through innovation; a crucial step to ensuring the longevity of the dairy industry and a way to keep existing customers and engage new ones too.

Two of the hottest areas for

innovation are clean label and natural functionality, as consumers seek minimally processed products, and new and traditional ingredients with natural health benefits. For example, sour milk products and kefir have gained popularity due to their high content of natural probiotics and their association with digestive health. Another important factor is country of origin and local sourcing, as dairy brands position themselves around authenticity, indulgence, and provenance.

Responding to environmental pressures and consumer demand for more sustainable foods, manufacturers are also investing heavily in organic ranges, with sales of organic dairy rising in developed markets (particularly North America and Western Europe).

For dairy alternatives, innovation goes hand in hand with the development process as companies seek to grow market share and extend their ranges. Flavor innovation in particular has a critical role to play as only four in ten consumers indicate that they are satisfied with the taste of plant-based alternatives.⁶ Creating a well-balanced profile for plant-based dairy alternatives is a particular challenge for product formulators as they seek to manage both off-notes

from plant-based and fortification ingredients and simulate the dairy taste and creamy mouthfeel of traditional dairy ingredients.

Unique flavors can inspire interest and help companies align with more natural and healthy profiles, for example the use of botanicals and spice like chamomile and turmeric. Whilst plant-based foods are believed to be healthier, in many cases they are heavily processed. As choice increases, consumers may place greater scrutiny on labels and companies will need to look at ways to achieve cleaner ingredient lists. Synergy's new Dairy by Nature functional flavor solutions tap into both health and sustainability trends. Providing authentic dairy flavors and concentrates with taste modulating benefits - such as masking and mouthfeel - customers have a choice between grass-fed dairy enriched solutions and dairy-free solutions.

THE OUTLOOK FOR DAIRY

Plant-based dairy alternatives are picking up considerable pace in multiple regions and although they are yet to catch up with dairy, companies are realizing the urgent need to create unique products with ingredients and flavors that will intrigue and entice consumers.

It could be that products addressing the best of both worlds could draw

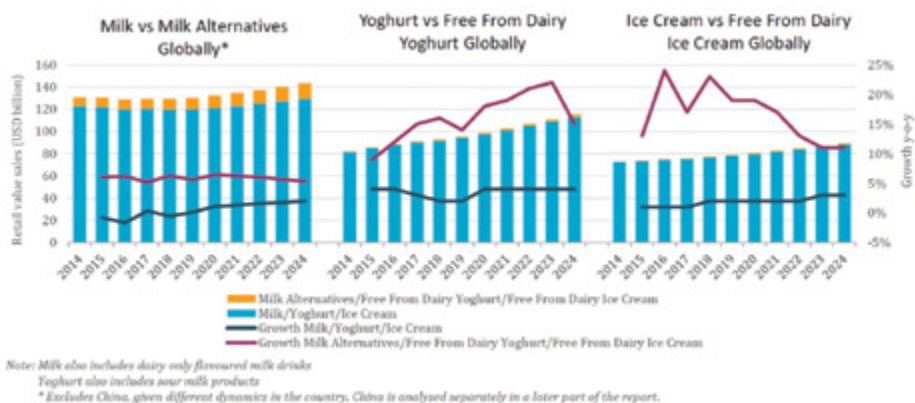


Figure 1: Growth of free-from dairy yoghurt and ice cream exceeds that of milk alternatives.⁴

significant attention in the future. For example, the introduction of hybrid products using both dairy milk and plant-based milk alternatives may prove more attractive to a wider consumer base. Such blends could offer the desired nutritional benefits of dairy milk while also appealing to the growing number of consumers who want to include more plant-based foods in their diet.

Dairy or not, consumers are looking towards brands that clearly address nutritional benefits and environmental considerations, with a preference for natural/organic messaging. Meeting this demand requires the collaborative effort between product developers and flavorists.

With extensive experience in ingredient production for diverse food and beverage applications, Synergy can help customers to improve performance and create products that stand out from the crowd. Synergy's toolbox offers a range of appealing flavors, including the latest trends, such as botanicals and flavor fusion varieties, which work in conjunction with the Dairy by Nature portfolio to help food manufacturers to satisfy and inspire their consumers.

References

1. Dairy and dairy products – OECD-FAO agricultural outlook 2019-2028, http://www.fao.org/3/CA4076EN/CA4076EN_Chapter7_Dairy.pdf
2. Dairy in a post-COVID-19 world, 2020 (Mintel)
3. Dairy Alternatives Market By Product Type (Soy Milk, Almond Milk, Coconut Milk, Rice Milk, Oat Milk, Hemp Milk, and Others), By Formulation, By Application, By Distribution Channel And Segment Forecasts, 2016-2026, Reports and Data, April 2019, <https://www.reportsanddata.com/report-detail/dairy-alternatives-market>
4. Post-dairy era: the unstoppable rise of dairy alternatives, Passport, March 2020
5. A year of innovation in plant-based drinks, yogurt & ice cream, 2020 (Mintel)
6. FMCG GURUS Top Trend 1: Plant Life Explored, March 2020.



* Author is Senior Category Manager, Synergy Flavours, based in Ireland and the UK

Dragon Fruit: A ‘Crazy’ Seeming Fruit Has a Powerhouse of Uses

■ By Rico R. Magda

There's nothing to laugh at with this insane fruit but the real fact is many are getting crazy about dragon fruit. And its quick popularity has been making some producer countries run like mad in catching up for more supply for more demands in the world market. The fruit gives the reminiscence of watermelon, kiwi, and pear or a combination of them packed with more nutrients and medicinals more than one can imagine. They call this fruit a 'crazy' one perhaps due to its flower that resembles a flame in explosion. Out of these flame-like flowers come some short-lived fruits appearing like brilliant pink rosebuds. This novelty fruit is now becoming popular in recent season.



The sour dragon fruit with strong taste is a common fruit in some arid regions. They are a staple food source in the Sonoran Desert, which nourish a large number of natives in that area. Some sweet pitaya taste like watermelon and used in folklore medicine.

Some sweet dragon fruits include: *Hylocereus undatus* or the white-fleshed pitahaya; *Hylocereus costaricensis* or the red-fleshed pitahaya; and, *Hylocereus megalantus* that has a white flesh but with yellow outer skin.

Fresh, mature fruits weigh from 150g to 600g (5.3 to 21.2oz) or more. Some reach a kilo and little more.

ZEROING ON THE FRUIT

In the last edition of Fruit Logistica in Berlin, many fruit traders expressed their willingness, after tasting the fruit, to buy China's 'Jindu number one' Red Heart dragon fruit with natural rose-like fragrance. The fruit grows off-season in Hainan, thus, ensuring the buyers of the regular availability of the fruit year round.

Vietnam has the largest supply of dragon fruits but the fast development of China's huge dragon fruit production has become a big challenge for Vietnam.

The most common varieties of dragon fruits have red skin with green scales likened to the legendary fire-breathing dragon.

The fruit comes from cactus species. It belongs to the genus *Stenocereus*

(*Pitaya*) and *Hylocereus* (*Pitahaya*), which refer to the tall flowering cacti species. *Hylocereus* cacti are indigenous in Mexico but now thriving in most of Central America as a result of introduction by Europeans. The fruit is also known as strawberry pear.

The English name of this fruit is 'dragon fruit' while the names attributed to the same fruit like pitahaya and pitaya come from Mexico, Central America, and northern South America. In China, it's called huolong guo, which literally means 'fire dragon fruit.' Dragon fruit is now widely distributed in various countries worldwide in Asian countries, USA, Israel, Australia, Cyprus, Canary Island, and elsewhere.

GROWING THE PLANT

The plant can be propagated sexually by seeds or asexually by stem cuttings. When using seeds as the propagules, they should be cleaned and well dried. Then sown in potting soil rich in compost. If

Table 1: Composition	<i>Hylocereus costaricensis</i>	<i>H. undatus</i>
Myristic acid	0.2%	0.3%
Palmitic acid	17.9%	17.1%
Stearic acid	5.49%	4.37%
Palmitoleic acid	0.91%	0.61%
Oleic acid	21.6%	2.81%
Cis-vaccenic acid	3.14%	2.81%
Linoleic acid	49.6%	50.1%
Linolenic acid	1.21%	0.98%

seeds are viable, they'll germinate after 11 to 15 days. Just like plants started from cuttings, they later find some support to climb on with the aerial roots. Dragon fruit plants produce short-time overnight flowers that wither in the morning. Night pollinators like bats and moths assist in self-fertilization. Cross-breeding is possible with other nearby varieties. It flowers about 3 to six times or more a year depending on varietal types and favorable conditions. The plant is limited by long cold and freezing temperature but can overcome hot climate of up to 40°C (104°F). After fertilization, fruit formation follows and fruit develops within 30 to 50 days. Harvestable fruits can be had 5 times a year or more.

Dragon fruit doesn't like excessive water or rainfall, which causes premature flower drops and fruit rots. In case of mature fruits, too much water causes fruit cracks while still attached on the branches. This condition also makes the plant susceptible to fungal and bacterial invaders.

THE FRUIT AS A NUTRITIOUS FOOD

The fruit somewhat resembles the taste of kiwi with the small, black and crunchy seeds. The soft flesh is commonly not too sweet and has low calories. The nutty seeds are rich in lipids. The flesh can also be used as food color for juices, medicinal preparations, and alcoholic beverages. The flowers are edible and can be prepared as tea. The fruit color is due to betacyanins, which belong to the family of pigments that include betanin. The pigments are also found in beets and amaranth.

Dragon fruits have seed oils having fatty acids. Two pitayas varieties, namely *Hylocereus costaricensis* and *H. undatus* (the red-and white-fleshed) have a specific fatty acid composition see table 1.

A serving size of 100g (3.5oz), fresh dragon fruits can give the nutrients shown in table 2.

Besides the above-mentioned nutrients, the pulps contain some antioxidants like Betalains. These red pigments protects LDL cholesterol from oxidation and damages. A group of compound called Hydroxycinnamates has shown some anti-cancer activities in both animals and test-tube experiments. The flavonoids in this fruit which act as antioxidants have been linked in reducing the risk of having heart disease. They also promote better brain health. More studies, however, are needed using human subjects.

Table 2: Nutrients per 100 g

Calories	50
Protein	1.1g
Fat	0.4g
Carbohydrates	11g
Sugar	9g
Fiber	3g
Vitamin C	(34% of RDI)
Iron	(1.9mg, 11% DV)
Thiamine	(2.7% of RDI)
Riboflavin	2.9% of RDI)
Vitamin B2	(3% of DV)
Vitamin B1	(3% of DV)
Phosphorus	22.5mg (2% of DV)
Vitamin B3	0.16mg (1% of DV)

In rare cases, people may develop an allergic reaction though the fruit appears to be generally safe. Two allergic reactions have been reported after consuming fruit salad mixture with dragon fruit.

PREPARING DRAGON FRUIT TO EAT

This fruit gives sweet and crunchy flavor that resemble that of kiwifruit and pear. Choose fruit that is bright and uniformly colored skin, which is not too soft or too firm. The fruit is easy to cut. The flesh inside has white or red color with numerous small edible seeds. Separate the seedy flesh from the inedible skin with a tablespoon by running it around the the circle of the sections.



Then slice up the flesh into cubes or cut it into any chunk pieces you please.

Sliced cubes can be returned back into the shell skin for serving. You may add the cubes into your favorite fresh fruit salads.

You can enjoy the fruit as fresh or drizzle it with honey for a Snack. You can also add this fruit to your bowl of muesli with apples, pears, bananas, nuts, and seeds. From the fruit flesh, you can also prepare some home-made smoothies and refreshing juices. Another way of enjoying the fruit is by grilling it. This way, the fruit gives a sweet caramel-like flavor. What more if you add a little amount of fiery chilipowder to have a lip-smacking treat. On summertime, dragon fruit becomes a favorite option in making refreshing sorbets or popsicles to beat the raging heat. Besides being delicious and loaded with vitamins, freezing the dragon fruit juice together with other juices with honey or brown sugar in a mould is a wonderful treat during hot summer months.

SOME HEALTH BENEFITS OF DRAGON FRUIT

The fruit can boost the body's defense system. With its rich Vitamin C content, it stimulates antioxidants in eliminating harmful free radicals, which are linked to fatal health issues like heart disease and cancer. The fruit is a powerhouse of vitamins, which include the B group like B1, B2, and B3. They are important in maintaining healthy blood pressure, skin health, proper cholesterol level, thyroid function, and carbohydrate metabolism. With its high fiber content, it maintains good bowel riddance. The fiber also facilitates a smooth waste passage by releasing digestive juices through the digestive tracts. This fiber prevents various disorders like irritable bowel

syndrome, constipation and fatal condition like colorectal cancer. Besides Vitamin C, it has Carotene, which has anticarcinogenic properties. The fruit can also boost the body against harmful fungi and bacteria. It increases the white blood cells in the body against toxins secreted by fungi and bacteria. Then it stimulates cell regeneration and facilitates faster healing of wounds. The fruit has no unhealthy saturated fats, which cause cardiovascular issues. The tiny seeds in the flesh have good fats that can reduce bad cholesterol in the blood, lessening the risk of having atherosclerosis.

ADVANTAGE WITH THE ROSE-LIKE FRAGRANCE

With the introduction of a new variety of dragon fruit having a rose-like fragrance, China is now testing the international market. China has come out with the 'Jindu number one' Red Heart dragon fruit. Grower told why their dragon fruit plantation stands out from other producer countries. He says that their plantation site is situated on the 18th latitude north with excellent soil and rich sunshine. Besides, the fruit has a natural rose-like fragrance and sugar content of 23 to 26. Since the fruit grows off- season in Hainan, the company ensures that exportation can be done without interruption throughout the year.

The new variety weighs from 0.25 to 0.75kg in winter and from 0.25 to 0.50 kg in summer. Besides the fruit, several companies who attended the trade exhibition expressed their interest in purchasing seedlings and plantation technology.

This insane fruit can add beauty to your table or counter. And by reaping the benefits, you'll agree that it goes beyond simply as a decorative item on your plate. Time to dig its goodness.

Herbal Tea: A Miraculous Drink

■ By Dr. Tarvinder Jeet Kaur

INTRODUCTION

Around the globe, Tea is the most widely consumed drink after water and herbal teas is proven to be one of the healthiest beverages loaded with antioxidants, minerals, and vitamins.

The term "herbal tea" refers to 'an infusion or tisane of dried herbs, spices, leaves, flowers, fruits, seeds, roots or other plant material that contains no *Camellia sinensis*'. The origin of herbal tea dates to Ancient Egypt and Ancient China, who have been using tea for its great taste and medicinal properties. Vast varieties of herbal teas are available, all with varying tastes and benefits.

Furthermore, herbal tea is naturally caffeine free as do traditional teas, hence can be a great alternative to daily empty calories and caffeinated beverages, while still providing great aroma along with natural immunity booster properties.

In present prevailing scenario, herbal tea is a blessing from nature to mankind as it gives limitless benefits-from refreshment, relaxation to detoxification and protection against chronic diseases and most importantly it is calorie-free. Following are some general benefits it offers to our body:

IMMUNE SYSTEM:

- Showing antibacterial, anti-fungal, anti-inflammatory effects
- Fight against infection
- Protects and relieves common respiratory ailments



- Protects against oxidative damage

INTEGUMENTARY SYSTEM:

- Prevents radical damage
- Anti-ageing
- Maintain flawless skin,
- Prevent allergies

RENAL SYSTEM:

- Helps in scavenging toxins
- Acts as diuretics
- Helps to maintain proper kidney health

CIRCULATORY SYSTEM:

- Reduces bad cholesterol
- Prevents blood clotting
- Helps weight loss and reduces obesity
- Improves blood pressure
- Improves heart functioning

SKELETAL AND MUSCULAR SYSTEM:

- Improve bone health
- Reduces pain and soreness
- Helps in relaxing
- Relieves muscular tension

DIGESTIVE SYSTEM:

- Soothes stomach, nausea, and vomiting issues
- Acts as an appetite suppressant
- Helps to boosting metabolism

NERVOUS SYSTEM:

- Stimulates brain function
- Improves alertness
- Relieves stress and anxiety
- Relieves headaches
- Relieves insomnia and improves a good night sleep
- Acts as an anti-depressant
- Prevents brain deterioration

REPRODUCTIVE SYSTEM:

- Reduces and relieves menstrual discomfort

- Reduces menopause discomfort and complications

ENDOCRINE SYSTEM:

- Regulates blood sugar and improves insulin sensitivity
- Rejuvenates tissue cells
- Aids detoxification
- Helps to prevent chronic diseases

Huge variety of herbal teas are available with their specific medicinal benefits. Some of the commonly consumed herbal teas along with their therapeutic effects are:

CINNAMON TEA:

Cinnamon tea aids in digestion, improves metabolism and helps in weight loss. This tea has calming properties along with good support for healthy circulation. Improves blood sugar levels and increases insulin sensitivity. It also prevents heart problems caused by high cholesterol and triglycerides. It protects the brain from neurological disease such as Parkinson's and Alzheimer's by improving the production of dopamine, which helps to normalize neurotransmitters.

CHAMOMILE TEA:

Chamomile tea is a perfect bedtime tea that improves general quality of sleep by soothing, calming and relieving anxiety. Research studies report improvement in generalized anxiety disorder. The calming effects of chamomile soothes stomach by relieving cramps and alleviating symptoms of heartburn. The daisy-like flowers of Chamomile contains 'apigenin', a flavonoid that effectively relieves stress along with protecting bones from damaging effects of stress hormone - keeping in check levels of cortisol. Chamomile also boosts another antioxidant flavonoid 'luteolin' Luteolin reduces fever, calms muscles spasms, and reduces blood pressure. It also has immune-boosting properties, making it

especially appropriate during cold and flu season.

CARDAMOM TEA:

Cardamom tea helps treat indigestion, prevents stomach pain, and relieves flatulence. It is helpful to drink a glass of cardamom tea for relieving anxiety disorders. Fights pulmonary disease where lots of phlegm is present and works to relieve cough as well. Drinking a cup of cardamom tea is also helpful for women who experience mood swings during their menstrual period.

CAYENNE TEA:

Cayenne tea helps to get rid of persistent coughs and heals scratchy, sore throats. The active ingredient, capsaicin, comforts breathing by reducing inflammation and clearing congestion.

CHRYSANTHEMUM TEA:

Chrysanthemum tea reduces body heat resulting from fever. It also helps in neutralising toxins and protects against liver damage.

DANDELION TEA:

With strong diuretic properties, antioxidant rich Dandelion tea aids immune system against infections by detoxifying, flushing, and eliminating toxins. Tea made from roots and leaves contains supplements for bone foundation like vitamin C and D, magnesium, zinc and potassium. These are important aspects for bone rejuvenation and maintenance. Dandelion tea reduces inflammation and offers bone-restoring antioxidants.

ECHINACEA TEA:

Echinacea tea treats common cold, sore throat and stuffy nose as it improves immune system which in turn, helps the body to fight off viruses and infections.



GINGER TEA:

If you are suffering from digestive problems like nausea, vomiting, stomach pain, indigestion, and heartburn, then ginger tea is at the top. Drinking ginger tea is one of the best methods for organically treating digestive problems as it contains phenols 'gingerol' and 'shogaol' found in the roots that stimulate digestive juices which aids in food digestion. It is widely used to treat nausea from motion sickness and morning sickness, since it interferes with serotonin receptors, which sends messages to the brain that makes one feel like vomiting. The roots of ginger plant enhances brain function by improving blood flow to the brain, resulting in better focus and natural antioxidants that protects brain health by reducing free radicals, menstrual discomfort and is also considered as an ideal treatment for joint pain, muscle pain, inflammation and weight loss.

GINSENG TEA:

Ginseng tea acts as an energizer to improve overall health by supporting the reproduction of white blood cells whilst preventing replication of bacteria in the body - to flush out the common cold or flu from the human body.

HIBISCUS TEA:

A deep red Hibiscus tea being abundant in polyphenols, minerals and vitamin C have been stated to help prevent cancer and

heart disease by decreasing LDL cholesterol, lowering hypertension, and fight bacteria (E. coli).

LEMON BALM TEA:

Lemon balm tea works to reduce cortisol (a stress hormone), causing drowsiness, and helps to aid the nervous system disorders. It also cures the digestive system, liver system and reduces premenstrual syndrome like irritability and insomnia.

PEPPERMINT TEA:

Peppermint tea contains menthol, a naturally occurring muscle relaxant that encourages total body relaxation. This tea aids digestion with relieving symptoms of abdominal gas, bloating and, muscle spasms along with cold and nausea.

PASSIONFLOWER TEA:

Passionflower tea contains alkaloids chrysin and benzoflavone known to increase GABA (gamma amino-butyric acid)- inhibitory of neurotransmitters, that prevents the brain from over-excitement and helps to attain balance. It acts as powerful nervine tonic to treat nervousness, stress, anxiety, and aids in restoring restful sleep. It also aids low blood pressure effects and relief from menopause related complications.

PARSLEY TEA:

Parsley tea is rich antioxidants, strong immune-booster, natural detoxifier, and gives relief from respiratory issues and aids cholesterol and healthy blood pressure maintenance. It aids diuresis which helps in proper kidney functions and prevents kidney stones. Moreover, this tea helps the circulatory system in strengthening blood vessels, improving blood circulation, and prevents anaemia - being good source of folic acid.

ROOIBOS TEA:

Rooibos tea is rich in antioxidants aspalathin, prevents blood sugar spikes-making it a good choice for people with diabetes or heart disease. Also improves the signs of ageing by reducing wrinkles, relieves acne and eczema. Furthermore, it is great for bone health and reduces the chances of developing arthritis and joint pain as it is rich in calcium and fluoride. Additionally, is recommended for treating headaches, asthma, and allergy.

ROSEHIP TEA:

Prepared from rose plants, rosehip is a natural source of bioflavonoids and vitamin C, which is great for skin, tissues, and the immunity system. This tea is considered a good remedy for cold, cough and fatigue. It also helps to repair kidney, liver, and blood disorders.

RED CLOVER TEA:

Red clover tea acts as a natural medicine for menopausal symptoms, cancer, mastitis, joint disorders, asthma, bronchitis, psoriasis, and eczema.

ROSEMARY TEA:

High level of antioxidant properties of rosemary helps fight diseases like cancer and other bacterium. Has immuno-boosting properties, in addition to its remarkable antibacterial influence that makes it effective in the treatment of bacterial infections.

TURMERIC TEA:

Turmeric tea has anti-inflammatory properties that soothes aches and pains such as migraines, fibromyalgia, and arthritis. Can be used to eliminate minor aches and pains after tough workouts at the gym or from menstrual cramps. It is a blood purifier and best for flawless and healthy skin.

TULSI TEA:

Tulsi leaves possess antibacterial, antifungal and antioxidant properties. In Ayurveda, Tulsi is the key ingredient to boost the immune system during and after illnesses. The medicinal properties of tulsi tea are recommended for relieving respiratory ailments. Lowers blood pressure and cholesterol by regulating cortisol levels reduces risk of stroke, heart attack, and other heart-related issues. Helps relieve headaches, lessen anxiety and depression, treat indigestion, remove intestinal parasites, ulcers, vomiting, gastric disorders, and prevents stomach or menstrual cramps, reduces pain caused from kidney stones, inflammation, joint pain and also helps to reduce inflammation, and joint pain.

Herbal teas come under the list of beverages due to its aroma, taste, and natural healing properties. Several scientific evidences are present regarding the therapeutic benefits of herbal teas. However, an overdose may cause medical issues.

Hence, before the consumption of herbal tea, it is suggested to get it prescription from a dietician to consume systematically.

It is rightly said that it is not just about the foods but also what you drink, that contributes to your health. Hence, with the right ingredients, methods, and quantity the properties of herbal tea acts as nature's blessings in the form of immense health benefits.

* Author Presently working as Professor, Food and Nutrition in Department of Home Science, Kurukshetra University Kurukshetra, Haryana. Having teaching post graduate classes and research experience of 22 years.

New Flavours and Trends in the Chocolate Industry

■ By Dheeraj Talreja



Demand for premium chocolates is at an all-time high, primarily driven by the wave of artisan chocolate producers putting more emphasis on the bean to bar concept. A research report by Mintel suggested that the total value of the chocolate market reached an estimated INR 172 billion in 2019 and is pegged to grow at a CAGR of close to 10% between the years 2019-2023. According to the report, the popularity of chocolate in India has increased, with 21% of Indians now consuming chocolate on a daily basis. Chocolate makers are constantly innovating by bringing new and interesting flavours into the market. When it comes to food, consumers today are not solely relying on money value. Below are key points shaping the global food industry.

1) **Indulgence:** When it comes to desserts, confectionery flavours and textures, then consumers

CHOCOLATE HAS ALWAYS BEEN A FAVOURED INDULGENCE IN THE F&B MARKET AND WITH NEW FLAVOUR PROFILES CONSTANTLY BEING DEVELOPED, THERE IS SOMETHING FOR EVERYONE. TODAY, CHOCOLATE HAS BECOME MORE OF AN EXPRESSION.

today are increasingly looking for truly indulgent experiences. This has obviously inspired new levels of creativity among confectioners and chocolatiers around the world. Combinations, previously, unheard of are now becoming popular, e.g- infusing chocolate with vegetables flavours such as kale flavoured filling in chocolate

bars and chocolate being used along with beetroot in cakes – is all the rage now. Texture is also being paid great attention to, new trends like larger chocolate chunks and crispy chocolate layers that add a bite are finding their way into the market.

2) **Premiumization:** Consumers today are more conscious of the processes that go into making of the products they consume. Hence, a lot of product descriptions on packaging include details of how a particular item is made. For example, details such as “stone ground” or “slow churned” and even the conching duration of chocolate are explicitly mentioned on the packaging. The demand for artisan products and quality ingredients has definitely seen an uptake in recent years, thanks to the rising number of high-end consumers in the market.

3) **Health:** Chocolate has always been an indulging product but, a complete no-no for those looking to get fitter, yet several researchers have debunked this myth. It is now a known fact that not all kinds of chocolates are unhealthy. In order to meet this demand for healthy chocolate, trends such as sugar-free or gluten-free chocolate have been on the rise. Hence, there is significant demand for dairy-free chocolate, and a lot of brands are also using milk as substitutes to produce vegan chocolate. Manufacturers are turning to adding more local flavours to dark chocolate to appeal an increasingly health conscious market segment. Hence, it is not uncommon to see honey, ginger, or citruses like lemon – that have proven health benefits when added to chocolates.

4) **Sustainability:** As consumers become increasingly conscious about environmental hygiene, brands are stepping up their game to promise sustainable production practices. Consumers today are aware of the environmental impact of certain products, take for example the presence of palm oil in our packaged products. Palm oil is extracted at great environmental cost, hence, several brands today are rethinking its use and instead switching to using other ingredients like coconut oil.

5) **Convenience or On-the-Go Products:** Since the pandemic has led to most people staying at home, the need for quick and easy meals has been on the rise. On-the-go products that are low on preparations are currently in high demand.

In the world of desserts and sweets, consumer preferences are changing

and many now prefer confectionery products to traditional sweets because of their convenience and longer shelf-life. Apart from these key trends shaping the chocolate industry, manufacturers are now focusing on different flavours and variants. Manufacturers around the world continue to innovate and blend sweet and savoury products. Consumers are increasingly becoming curious to give the most outrageous flavours a try.

Below are some of the more popular flavours that are gaining preference.

a. **Unusual Fruits:** We already know of strawberries, raspberries and cherries being added to chocolate, but there is a whole new range of fruits being integrated into chocolates today. Peach is one such fruit that has become a popular addition to chocolate.

b. **Nuts:** Hazelnut is the top nut ingredient in chocolate, followed by almonds and peanuts. But there is also a growing popularity of adding pistachio, flax seeds and sunflower seeds in chocolates.

c. **Childhood Indulgences:** Manufacturers are playing on consumers' nostalgia by bringing back childhood flavours like cinnamon rolls and others in the market.

d. **Flavour Combinations:** Salty snacks featuring confectionery coatings have become very popular. The best example of this trend would obviously be the beloved caramel and chocolate popcorn.

e. **Herbs & Spices:** They are witnessing a rise in popularity thanks to the increased emphasis on their health benefits. Consumers continue to be

drawn to trends such as chilli and cinnamon chocolate or dark chocolate infused with ginger.

f. **Citrus & Sour:** Exotic citrus ingredients, such as the Japanese yuzu, are going to remain popular in 2020. The more familiar citruses such as orange, mandarin, grapefruit, lime, and lemon continue to be popular.

Chocolate has always been a favoured indulgence in the F&B market and with new flavour profiles constantly being developed, there is something for everyone. Today, chocolate has become more of an expression. So, it can be eaten depending on a person's mood and flavour of choice. Consumers in India have had a gradual shift of allegiance and many today now favour chocolates as gifts during diwali instead of just traditional sweets. This has obviously been possible to the rising disposable income of the middle-class.

The rapid growth of the industry coupled with these new trends is set to expand Indian and global markets. Indian brand manufacturers are leaving no stone unturned to develop local flavours with added health benefits to appeal to domestic consumers. Manufacturers are emphasizing on co-development to optimize business growth. AAK Kamani being a leader in manufacturing of speciality oils and fats for confectionery products collaborates with chocolate manufacturers. This is done by connecting with them through our expertise and unique customer innovation centre. We as a company help businesses grow and thereby create new opportunities.

* Author is President at AAK Kamani

New World-Class Potato Processing Line for Bem Brasil

Key Technology, a member of the Duravant family of operating companies, announces they are teaming up with Bem Brasil, the largest potato processor in Brazil, to add a new state-of-the-art potato strip processing line to Bem's Perdizes facility. This multimillion dollar purchase includes six VERYX® digital sorters, an ADR EXOS® automatic defect removal system, three Sliver Sizer Removers and 57 Iso-Flo® vibratory conveyors on a line designed to process 30 metric tons of frozen french fries per hour. Bem chose to partner with Key to maximize food safety and consistently meet final product quality specifications while improving operating efficiencies and increasing yield.

"We selected Key for two primary reasons – their leadership in our industry and our trust in the company

and their solutions," said Walter Takano, Foreign Trade Manager at Bem Brasil. "Our confidence is based, in part, on years of experience with their Iso-Flo shakers on our other lines. To learn more about their VERYX sorters and ADR systems, we visited Key and then traveled to see the equipment operating at major potato processing facilities in North America and Europe. Overall, Key's expertise and the reliability of their technology impressed us."

Key will equip Bem's VERYX sorters with its full suite of sorter intelligence tools as well as top- and bottom-

mounted sensors to achieve full-surface inspection. The sorters immediately prior to packaging will also feature Key's patented Pixel Fusion™ technology to find and remove even the most difficult-to-detect FM and defects immediately prior to packaging. Images of FM will be time-stamped and archived for retrieval utilizing Key's FMAAlert™ feature.

VERYX combines all camera views into one all-surface analyzed object, which enables the sorters' patented Sort-to-Grade (STG) software to automatically maintain final product specifications for both defect and/

THE SORTERS' INFORMATION ANALYTICS SOFTWARE EXPORTS REAL-TIME INDIVIDUAL OBJECT DATA, ALLOWING BEM TO COLLECT, ANALYZE AND SHARE BIG DATA ACROSS THE ENTERPRISE TO REVEAL PATTERNS, TRENDS AND ASSOCIATIONS, WHICH CAN HELP OPTIMIZE PROCESSES.



or length profile without operator intervention to increase yields and eliminate mechanical length grading. The sorters' Information Analytics software exports real-time individual object data, allowing Bem to collect, analyze and share big data across the enterprise to reveal patterns, trends and associations, which can help optimize processes.

"Bem is the largest potato processor in Brazil and is committed to becoming a global leader by investing in state-of-the-art technology as they grow.

We are honored that they have decided to partner with us," said Bret Larreau, Director of InterCon Sales - Latin America and Asia Pacific at Key Technology. "Before they selected their suppliers, they took a close look at what other world-class french fry facilities are

doing. The real-world examples of yield increases, food safety practices and process optimization achieved using tools such as our STG, FMAAlert and Information Analytics, plus the reliability and consistency of our VERYX platform, made a compelling impression that led to securing this business. Additionally, they're receiving great customer support locally from Schur, our sales and service rep in Brazil.

Takano concluded, "For us, the single most important thing is taking good care of our consumers. Working with Key, we'll ensure we produce the ideal final product quality. At the same time, we expect to increase yield and reduce operating costs."

ABOUT KEY TECHNOLOGY, INC.

Key Technology is a global leader in the design and manufacture

of automation systems including digital sorters, conveyors and other processing equipment. Applying processing knowledge and application expertise, Key helps customers in the food processing and other industries improve quality, increase yield, and reduce cost. Key manufactures its products at its headquarters in Walla Walla, Washington, USA; Beusichem, the Netherlands; Hasselt, Belgium; and Redmond, Oregon, USA. Key's domestic facilities are certified to the ISO 9001:2015 standard. Key offers customer demonstration and testing services at five locations including Walla Walla, Beusichem, and Hasselt as well as Sacramento, California, USA and Melbourne, Australia; and maintains a sales and service office in Santiago de Queretaro, Mexico. Key is a Duravant Company.

Ultrasound technique in food processing

■ By Leela Chauhan* and Khan Chand**



The current focus of both industrial and laboratory scale of food processing is towards the development of products with fresh-like characteristics, high-quality taste, flavour, and texture. Food processing refers to transformation of agriculture produce through numerous operations for shelf-stability, portability, usefulness and value-added product safe for human consumption. Various traditional processing and preservation techniques are used to process raw food products as have an inherent problem of significant losses of food texture and quality. The novel processing methodologies are designed to circumvent this problem and not only improve the quality of processed product but also reduce the processing time as well.

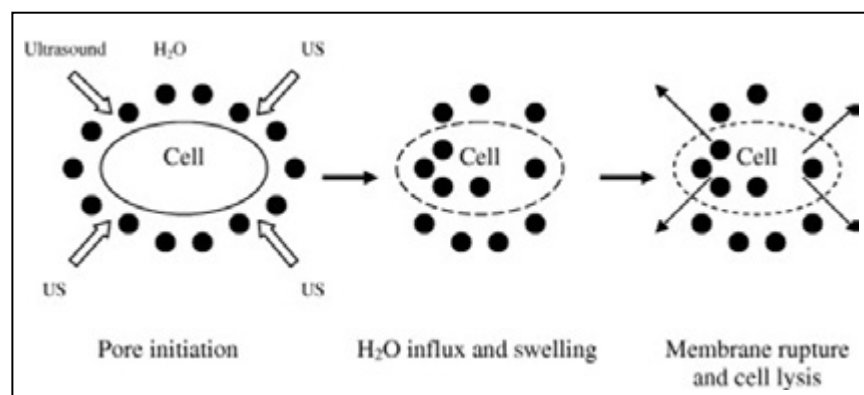
INTRODUCTION

Ultrasound processing is a non-thermal processing technique that necessitates an elastic medium to spread over and work under frequencies from 20kHz to 10MHz. The principle of ultrasound is based on the elastic deformation of ferroelectric materials within a high frequency electrical field and is caused by the mutual attraction of the molecules polarized in the field (Knorr et al. 2004). For polarization of molecules a high-frequency alternating current will be transmitted via two electrodes to

the ferro-electrical material. Then, after conversion into mechanical oscillation, the sound waves will be transmitted to an amplifier, to the sound radiating sonotrode and finally to the treatment medium (Pingret et al. 2013). The major effects of ultrasound on a liquid medium may give rise to the cavitation phenomena which is issued from the physical processes that creates, enlarges and implodes micro bubbles of gases that is formed in the liquid by the compression and decompression of molecules that

constitute the medium (Fig.1). The collapse of the cavitation bubble creates a transitory spot with elevated temperature and pressure that is estimated to be up to 5000 K or 5000 atmospheric pressure. It can dramatically accelerate the chemical reactivity into the medium. This phenomena is found in numerous applications done by the food industry, such as processing, extraction, emulsification, preservation, and homogenization (Table 1). Besides the parameters intrinsically related to the ultrasonic device such as the frequency, wavelength, and amplitude of the wave, the ultrasonic power and the consequent intensity also have an effect on the process and can be optimized (Chemat et al. 2017).

FIG 1. MECHANISM OF ULTRASOUND PROCESSING



THERE ARE MULTIPLE VARIATIONS OF ULTRASOUND PROCESSING WHICH CAN BE USED IN FOOD PROCESSING.

TABLE 1. ULTRASOUND USED FOR PROCESSING OF VARIOUS FOODS (CHEMAT AND KHAN, 2011)

Applications	Principle	Products	Advantages
Filtration	Vibrations	Liquid food products eg. Juices	Increases membrane permeation. Requires less time. Enhances filtration process
Freezing / Crystallization	Uniform Heat Transfer	Milk products Fruits & Vegetables Meat	Improves freezing by better preservation of the microstructure. Requires less time and small crystal size. Improved diffusion. Rapid decrease in temperature.
Thawing	Uniform heat Transfer	Frozen products	Reduction in thawing time. Preservation of color Inhibiting lipid oxidation. Improved product quality. Reduced product dehydration
Brining/Pickling		Cheese, meat, fish etc	Low water activity and longer shelf life Requires less sodium chloride Uniform distribution of salt in less time
Drying	Uniform Heat Transfer	Dehydrated Food Products	Intensification of mass transfer. Shorter processing time Enhanced organoleptic properties. Increased drying rate due to less resistance.
Foaming	Dispersion of gas bubbles	Protein	Increased foaming capacity Reduces foam stability and water retention capacity
Degassing / Deaeration	Agitation	Carbonic beverages, aqueous solutions.	Reduces the bottles broken and beverage overflow Less time required
Cooking	Uniform Heat Transfer	Meat Products Vegetables	Requires less time Improved nutrient retention. Improved rate of heat transfer. Enhances organoleptic properties. Improved tenderization
Emulsification	Cavitation Phenomenon	Emulsions eg. Mayonnaise	Enhances rheological properties Improves emulsion stability Requires less time
Cutting	Cavitation Phenomenon	Soft Products eg. Cheese, Bread	Accuracy in cuts Requires less time Clean cuts with minimized product loss

Sterilization / Pasteurization	Uniform Heat Transfer	Milk, Juice	Reduced processing time Efficient microbial inactivation Low temperature requirements Low energy requirements
Extraction	Diffusion	Food and plant material	Increase the efficiency of extraction Reduces the time of extraction Less solvent required
Re-hydration	Absorption	Dried vegetables, grains etc.	Reduction in time of re-hydration

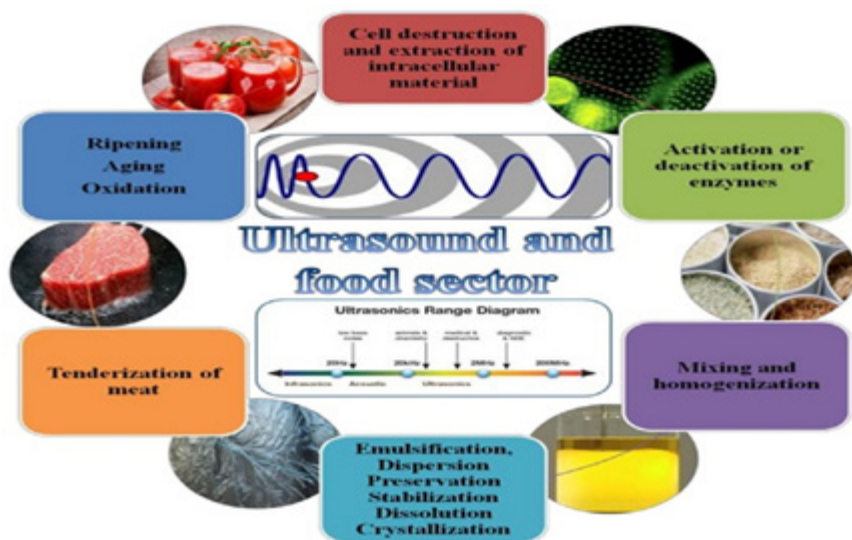
APPLICATION IN FOODS

The ultrasonic technique finds its use in many applications such as monitoring the concentration of aqueous solutions and suspensions, determining droplet size and concentration in emulsions, monitoring crystallization in fats, and monitoring creaming profiles in emulsions and suspensions, in particular for on-line determination of these properties during processing (Fig 2). It is a rapid, precise, non-destructive, and non-invasive technique that can be applied to a concentrated or optically opaque system. Moreover, it can easily be adapted for on-line measurements, which would prove useful for monitoring food

processing operations. There are multiple variations of ultrasound processing which can be used in food processing. The high-intensity ultrasound is used for degassing of liquid foods, induction of oxidation/reduction reactions, extraction of enzymes and proteins, inactivation of enzymes and microorganisms, and induction of crystallization processes. Ultrasound can also be combined with other types of treatments to enhance the effectiveness of the treatments. Inactivation of microorganisms by combining ultrasound treatments with anti-microbials, pressure, and heat is widely accepted. Low-intensity ultrasound is used in

THE USE OF LOWER FREQUENCY REDUCES THE SPATIAL RESOLUTION. IN SOME CASES THERE ARE A NUMBER OF SAMPLE VARIABLES CHANGING SIMULTANEOUSLY, AND THAT AFFECTS THE ULTRASONIC PROPERTIES. IN THIS SITUATION, THE SIMPLE SENSOR MAY NOT BE ENOUGH, RESULTING IN BROAD AND DIFFICULT TO RESOLVE PEAKS.

FIG 2. ROLE IN FOOD SECTOR



stimulation of living cells and enzymes, surface cleaning of foods, ultrasonically assisted extraction, crystallization of fats and sugars, destruction of foams, extraction of flavorings, emulsification, filtration, drying, freezing, tenderization of meat, measurement of concentration of simple solutions, meat composition mixing and homogenization, and precipitation of airborne powders. Even so, applications of ultrasound in food processing are not limited to quality assurance but many applications of this novel technology are used. Food manufacturers can use ultrasonic nondestructive technique (NDT) to locate foreign bodies such as glass, organic residues, or even

ULTRASOUND HAS PROVEN ITS ABILITIES IN THE FOOD INDUSTRY INTO PRESERVATION, EXTRACTION, AND PROCESSING.

bacterial infections in both solid and liquid foods, even after foods are packaged. Other applications include characterization of cellular structure of pre-cooked dough to obtain predictions of the quality of the cooked product and to monitor the movement of ice front in a solid food as it is slowly freezes to determine the energy efficiency of the freezing process.

CHALLENGES IN ULTRASOUND PROCESSING

The presence of small gas bubbles in a sample can attenuate ultrasound so much that sometimes an ultrasound wave cannot propagate through the samples. This problem can overcome by taking reflection rather than transmission measurements, even though the signal from the bubbles may interfere with other components. A lot of information about the thermo-physical properties such as densities, compressibility, heat capacities, and thermal conductivities of a material is needed in order to make theoretical predictions of its ultrasonic properties. Many foods such as plant tissues, aerated foods, and some semi-crystalline fats (chocolates) have a very high level of attenuation, which can make measurement extremely difficult. The use of a shorter path length may not be feasible in a real process due to cleaning, fouling, and other practical restrictions. The use of lower frequency reduces the spatial resolution. In some cases there are a number of sample variables changing simultaneously, and that affects the ultrasonic properties. In this situation, the simple sensor may not be enough, resulting in broad and difficult to resolve peaks. If it is difficult to get precise and uniform

temperature control throughout the sample, additional errors in further measuring the property based on temperature may be introduced. The presence of air in the sample results in huge impedance mismatch between gas bubbles and other food materials, which causes reflection by air bubbles and a very strong scattering. Ultrasound can thus be used as a technique for detecting including air, which is not otherwise readily visible.

CONCLUSION

Ultrasound has proven its abilities in the food industry into preservation, extraction, and processing. Ultrasound is being increasingly used to enhance various processes in the food industry and has become an extremely promising technology on the processing front. It becomes more powerful when used in combination with other techniques for the preservation of food. It has several advantages over other pre-existing or conventional technologies and copes up to overcome shortcomings when coupled along with them. Ultrasound with its abilities to increase efficiency and reduce the time required for various processing operations has promised a progressive future. In midst of ultrasound, full-fledged processing unit operations can be accomplished within minutes or seconds, along with a reduction in the overall cost of processing, providing high purity levels of the final product, eradicating wastewater treatment, post-processing with a minimum of energy. The lack of knowledge, understanding, and reluctance to let go of traditional practices, prevents the implementation and commercialization of ultrasound at industrial levels.

References

1. Povey M. J. and Mason T. J. (1998). *Ultrasound in food processing*. Springer Science and Business Media.
2. Knorr D., Zenker M., Heinz V. and Lee D. U. (2004). Applications and potential of ultrasonic in food processing. *Trends in Food Science & Technology*, 15(5): 261-266.
3. Chemat F. and Khan M. K. (2011). Applications of ultrasound in food technology: processing, preservation and extraction. *Ultrasonics Sonochemistry*, 18(4): 813-835.
4. Chemat F., Rombaut N., Sicaire A. G., Meullemiestre A., Fabiano-Tixier A. S., and Abert-Vian M. (2017). Ultrasound assisted extraction of food and natural products. Mechanisms, techniques, combinations, protocols and applications. A review. *Ultrasonics Sonochemistry*, 34:540-560.
5. Nayak B., Li Z., Ahmed I. and Lin, H. (2017). Ultrasound: advances for food processing and preservation. Removal of allergens in some food products using ultrasound, 267-92.
6. Villamiel M., García-Pérez J.V., Montilla A., Carcel J. A. and Benedito J. (2017). *Ultrasound in food processing: Recent advances*. John Wiley & Sons.

*The author is Ex-Ph.D student,
Department of Post Harvest Process and
Food Engineering, College of Technology,
G.B.P.U.A. & T., Pantnagar, Uttarakhand

** The author is Associate Professor,
Department of Agricultural Engineering,
SASRD, Central University of Nagaland,
Medziphema, Dimapur



Sensory Evaluation: BIS way

Sensory Evaluation is a commonly used term in the food industry and even for those who aspire to enter this industry. Yet, sometimes it is misunderstood by the professionals who are in this field of study. This misunderstanding essentially comes due to the lack of knowledge about this working body. According to Sensory Food Network Ireland, sensory evaluation means a scientific discipline that is used to measure and analyse people's responses to products as perceived through the 5 senses namely sight, smell, touch, taste, and sound.

Sensory Evaluation is often conducted in the Food and Beverage industry due to its ability to foresee the pitfalls in the product itself. This helps companies introduce suitable and the best product to the market.

It also helps to prevent companies from introducing a product that might not match consumer's preferences with the help of sensory evaluation. Companies at times fail to understand the best possible manner of using this regulation.

The Bureau of Indian Standards have developed guidelines of sensory evaluation through the standard IS 6273. These standards come in three different parts-

1. Part 1-Optimum requirement,
2. Part 2- Methods and Evaluation Cards
3. Part 3-Statistical analysis of data.

This article offers a basic overview of the standard.

Part-1 Optimum Requirements:

Part 1 of the standard IS 6273, deals with optimum requirements for the

evaluation. This includes Personnel, selection of sensory panel, set up of laboratory, sample preparation and presentation etc. All the important aspects are discussed below:

Personnel:

1. Panel Organizer: A Panel organizer is the person who is in-charge of conducting a session. The personnel should form apt questionnaires by consulting the product developer and should be responsible for moderating, organising sessions, and act as a link between the product developer and the panel. No panel organizer shall impose their ideas on the panel lists.

2. Statistician: A statistician should choose the best suitable for sampling procedure, evaluation card and analysis.

3. Preparation Room i/c: The preparation room IC should make sure that all the sample preparation and presentation is decided by the statistician.

Panel: A panel member's selection is based on some basic criteria like their health, average sensitivity, capability of independent judgement, freedom from prejudice, and the member's willingness to spend time during the course of action.

Depending upon the types of panel members chosen for a particular study by a sensory session organizer, the number of members may vary (as mentioned below):

1. Trained Panel: A small group of 5-10 members can be chosen and maintained to understand the intensity or the differences to determine the overall quality of food. They need not be experts in the panel. They can undergo training sessions and gradually develop the skill to analyse the products more efficiently. Especially in flavour industries, there is a need to undergo a higher degree of training in order to effectively analyse the broad spectrum of flavours.

2. Semi-Trained Panel: This panel should consist of members who are normally familiar with different classes of foods. They shall be able to discriminate and effectively communicate the differences. This panel must be used to understand the acceptability or preference of a final product. It is used before conducting full-fledged large-scale consumer trials. A typical group of semi-trained panels may consist of 25-30 members.

3. Untrained Panel: Untrained panel is also known as a

consumer panel. This panel consists of randomly selected potential customers of the target markets. The panel members should be such that they ensure representation of the market area, from different age groups, sex, race and economic strata of a market. The group consists of minimum 100 members.

Laboratory setup: There is a proper degree to how the sensory laboratory has to be designed. The sensory evaluation has to be conducted in a quiet, properly illuminated and odour-free room. The sensory booth has to be comfortable for the s to be able to carry out a prolonged analysis,

WHEN A TEST INVOLVES MULTIPLE SAMPLES, THE ORDER OF PRESENTATION OF THESE SAMPLES IS VERY ESSENTIAL. FOR EXAMPLE, A Milder PRODUCT SHOULD BE EVALUATED FIRST FOLLOWED BY A SPICY PRODUCT.

whenever required. Temperature of the room, availability of drinking water, space and vicinity of wash basins are few of such requirements. The sample preparation room should be separate and the layout should be made such that a single person can efficiently attend to all the s in their respective booths.

Sampling and Testing: The sampling should be carried out by a trained and experienced person, to obtain a representative sample. The samples are presented uniformly so that there is no involvement of biases. In case of foods which trigger intense physiological perceptions like vinegar, spices, high heat containing foods. There may be a

need for dilutions during the sample preparation.

In addition to these, there are certain other etiquettes and rules of a sensory test as noted down below:

1. Temperature of sample: The temperature should preferably be at room temperature for difference testing. For preference testing it is suggested to serve at the common serving temperature of food.

2. Time of testing: The time for testing should be one hour before or after lunch timings.

3. Prohibition: There is a clear prohibition on the usage of pan, tobacco or alcohol at least half an hour before the test.

4. Number of samples: The number depends on how critical is the parameter and the profile of food is sustaining. If the sample is mild, then a large number of samples can be tested. In case the parameter profile is strong, only a few samples should be analysed at a time.

5. Coding: Coding can be done by using a table of random numbers (A random number table is a series of digits (0 to 9) arranged randomly in rows and columns).

6. Order of presentation: When a test involves multiple samples, the order of presentation of these samples is very essential. For example, a milder product should be evaluated first followed by a spicy product.

7. Evaluation Card: The evaluation card should be printed clearly and should be easily comprehensible to the panel members. It should not create any confusion.

PART 2 & PART 3 CAN BE REFERRED IN TABLE A PRESENTED BELOW

TABLE A:

S.No	Name of the Test	Statistical Test	Application
	Difference Test: Difference testing is used to determine if foods differ in certain aspects. Some of these aspects include the test but are not limited to odour, taste, and texture.		The qualitative & quantitative differences and preferences are tested as per the evaluations resulting from the test product and that done by the
1	Paired-Comparison test: Pair of samples are arranged and panelists are asked to find whether the samples are different (Simple difference test) or does it indicate which of the sample is less in specific sensory attribute. (Directional difference test).	X2 test or t-test is conducted.	Simple and directional differences for a specific parameter is measured. It can also be used for panel training.
2	Duo-trio test: Three samples are given out - out of which two is identical. The identical can be sample or reference. The panelists are asked to take the sample which is similar to the reference.	X2 test or t-test.	Different product samples are evaluated under the same quality parameter with a reference. It is used only when inter sample flavour has a carry-over effects that defines absence or quantity.
3	Triangle test: Two identical (reference) and one different (test) samples are given then panelists are asked to pick the odd one out.	X2 test or t-test.	To detect inter sample difference or panel testing difference.
4	Ranking test: All the samples are coded and ranked based on the intensity of an attribute or overall acceptability.	For a panel agreement coefficient of concordance is used if number of samples exceeds 7 use X2 test. If number is within 20, use rank sum analysis for preference/difference or else we can use X2.	This is used to rank several samples of an attribute (intensity ranking) or preference of products (preference ranking)
Rating test: Difference tests is carried out with a qualitative aspect.			
5	Monadic Test: Ask the panelist to identify the presence, absence and/or intensity of a specific quality parameter of a sample. Repeat the test at different times and compare the results	Convert intensity scores in numericals and ANOVA.	When a sample has a strong flavour that precludes the ability to test different samples in same session.
6	Two Stage Triangle test: Three coded samples are used - two identical (reference) and one test sample . The panelist is asked to pick the odd one out. Once it is done, then the panelist is asked to indicate the intensity of difference using scores to indicate the preference between the identical and odd sample.	Odd samples should be analyzed by binomial distribution. Discard the data if it points out wrong odd samples. The difference scores is analyzed by ANOVA.	Similar application of triangle test is carried and results in differences and preferences.
7	Hedonic Rating: These are asked to rate the intensity or acceptability on 7 or 9 pointer scale which is described by words.	Fast method: Convert rating to ranks and rank-sum analysis. Rigour method: Convert ratings to scores and ANOVA.	Degree of pleasure or displeasure of a product.

8	Numerical Scoring test: Multiple samples are analyzed together. The scoring is usually done on a 10-point scale or represented by a specific band of numbers for acceptability (Example: 1-3 Poor, 4-5 Fair, 6-8 Good and 9-10 Excellent)	t-test is done to compare two samples. Dunnett's test for comparing against reference. Range method is used for multiple sample comparison and Duncan's multiple range test is done for multiple comparison.	This is used to assess the quality of a set of similar products, NPD.
9	Composite Scoring test: Weighted rating scale for each individual attribute based on their relative importance contributing to the overall quality of the product. Ask the panelist to rate each attribute based on the assigned weighted score and by adding all the individual scores.	t-test is used to compare two samples. Dunnett's test compares against reference. Range method compares for multiple comparisons and then Duncan's multiple range test is used for multiple comparison.	
Please refer the standard, IS 6273 Part II for specimen Evaluation card for different evaluation method.			

Hence, we conclude that the art of sensory evaluation does not limit to mere testing, rather it involves hard-core science, psychology or statistics behind it. A lot of advanced testing methods and practices involve the use of software to carry out the statistical analysis part.

With increasing popularity of sensory science in the food industry, there would be a need of more awareness in this area. By strictly following the standards and the guidelines, the efforts conducted during a sensory evaluation could be made more useful.

Mono Material Demand in Food Packaging

Global flexible packaging and lidding films supplier KM Packaging is meeting the demand for mono-material food packaging with mono polymer structure lidding films.

The company offers mono polymer lidding films for all food tray types including PP, Alufoil, CPET and APET. Particularly relevant to the meat, poultry, fish and seafood markets, we offer weld seal mono-material lidding films within the K SEAL range.

These have an all-polyester structure and are available with a high-oxygen barrier. They offer exceptional transparency, with excellent anti-fogging properties, and weld seals to rPET or APET trays.

It is a sustainable material choice for food manufacturers thanks to the entire single polymer pack being designed for recycling in the PET recycling stream.



MANY TRAY MANUFACTURERS ARE ALSO RESPONDING TO THE DEMAND TO MOVE AWAY FROM MULTI-LAYER AND LAMINATED MATERIALS FOR FOOD PACKAGING DUE TO THE DIFFICULTIES OF SEPARATING THEM FOR RECYCLING.

In summary, key features include:

- Mono structure made of one material type.
- Designed for recyclability.
- High oxygen barrier available.
- Exceptional transparency.
- Excellent anti-fogging.
 - Ideal for protecting meat, poultry, and fish

Charles Smithson, Managing Director of KM Packaging, said: "Many manufacturers within the meat and fish industry face the problem of 'How can we move to more mono-material solutions to avoid putting multi-layer trays and films with different plastics combined into the market?' The sustainability



of packaging solutions to protect, present, and preserve foodstuffs is a key consideration.

"Our product enables them to switch from 'hard-to-recycle' mixed polymer plastics, for example a PET/PE food tray, to a mono-polymer food tray with the same mono-polymer top film to seal to it.

"Offering excellent weld seals to PET trays, K SEAL has exceptional clarity, anti-mist, and an effective barrier, performing in the same way as existing films used by meat and fish packers, while providing a packaging solution that is 100% designed for recycling in the number 1 PET recycling stream."

Many tray manufacturers are also responding to the demand to move

away from multi-layer and laminated materials for food packaging due to the difficulties of separating them for recycling.

These mono-material initiatives are also aligned to the "5 steps to Build a Circular Economy for Flexible Packaging", as defined by CEFLEX. The steps include:

- Drive collection of all flexible packaging for sorting and recycling.
- Sort the suitable mono-material fractions so that they are available to be recycled.
- Redesign multi-material flexible packaging to mono-materials with existing recycling streams.

Charles Smithson added: "Our in-house technical team work

closely with our customers, tray suppliers, and sealing machinery manufacturers to assess and trial our lidding films and find the right packaging solution for the application.

"We are currently seeing unprecedented interest from meat and fish packers across Europe for mono-material solutions.

"We continue to drive innovation in sustainable solutions and these additions to our K SEAL product range complement our existing mono-material lidding films found in our other core ranges, K PEEL and K FOIL. We are also working on incorporating Post-Consumer Recycled (PCR) content into these films ahead of proposed tax legislation."

Packaging of Frozen Food

INTRODUCTION

Freezing food is one of the oldest and the most convenient method of preserving food for longer period of time. It keeps the color, taste and texture intact, if preserved at correct temperature.

The process involves three stages namely pre-treatment of the food, freezing and apt frozen storage.

The first stage of the freezing process is pre-treatment. This involves blanching, heat and dipping treatments, cryoprotection and more. These treatments help to prepare the food. It is important to remember that an effective freezing process will be able to retain already existing quality of food and not improve it. Therefore, the pre-treatment process aims to maintain quality and safety of frozen food.

Preservatives are not required because microorganisms do not grow when temperature of the food is below -9.5°C . This temperature is sufficient on its own to prevent food spoilage.

PACKAGING OF FROZEN FOOD

There are three types of packaging used for frozen foods: primary, secondary, and tertiary.

1. **Primary Packaging:** The primary packaging is in direct contact with the food. The food is kept inside the package, up to the time of use.
2. **Secondary Packaging:** Secondary packaging is a form of layered packaging used to handle products together for sale purpose.
3. **Tertiary Packaging:** Tertiary packaging is used for bulk transportation of products.



- Packaging materials should be moisture-vapour-resistant/ moisture barrier bag (e.g. glass and rigid plastic) to prevent evaporation, thus retaining the highest quality for frozen foods.
- Air-tight packaging must be done using a vacuum or gas-flush system to prevent moisture and oxygen.
- Most bags, wrapping materials, and waxed cartons used to package frozen foods are moisture-vapour-resistant.
- The containers should be leakage-free and easy to seal.
- Durability of the material is another important factor as packaging material must not become brittle at low temperatures and crack.
- Glass, plastic, tin and other heavily waxed cardboard materials are rigid containers used for packaging of liquid food products.
- Non-rigid containers include bags and sheets made of moisture-free, heavy aluminium foil, polyethylene or laminated papers.

Bags are commonly used packaging materials such as frozen fruits and vegetables due to their flexibility

during processing and handling. They can be used with or without outer cardboard cartons to protect against tearing.

IMPACT OF FREEZING ON NUTRITIONAL VALUE

Freezing doesn't affect the calorie count, the fiber content, or the mineral content of a food. Though the freezing process can make a difference with a few vitamins (such as folate and vitamin C), but most food's nutritional value will be maintained after freezing.

Freezing won't change the amount of fat, protein, carbohydrates, or sugar in a particular food. The fluid content can change, however, which is often apparent when you thaw your food (you might see a puddle of liquid as the water drains away).

Vitamin content of frozen foods:

- **Vitamin C:** Usually lost in a higher concentration than any other vitamin
- **Vitamin B1 (Thiamin):** A vitamin loss of 25 percent is normal. Thiamin is easily soluble in water and is destroyed by heat.

- **Vitamin B2 (Riboflavin):** Not much research has been done to see how much freezing affects Riboflavin levels. Studies performed on Riboflavin are inconclusive. One such study found 18 percent vitamin loss in green vegetables, while another found a 4 percent loss. It is commonly accepted that the loss of Riboflavin happens during pre-treatment rather than the actual freezing process itself.
- **Vitamin A (Carotene):** There is loss of carotene during the preparation of freezing and freezing of most vegetables. Vitamin loss is incurred during the extended storage period.

PACKAGING INDUSTRY FOR FOOD:

The packaging industry plays a crucial role by adding value to manufacturing industry such

as agriculture, pharmaceuticals, retail, FMCG and more. Basically the market has been growing due to solid demand from food and pharmaceutical industries. The paper packaging market contributes more than 30% of the overall market share and dominates other packaging domains.

As food safety and packaging norms are getting stricter, it is expected to promote use of good quality packaging. Affordability, urbanized households and time compression has expected to give way to packaged food industry. Government aims to make India a global manufacturing hub whilst having a positive impact on growth of packaging industry.

SCOPE IN FUTURE

A noticeable rise was seen in demands of frozen food packaging

industry in the global markets. It has upsurged due to significant change in daily dynamics of urban households. Convenient, quick and easy ways to consume food has risen the demand for frozen foods. It has become a healthier choice and has more health benefits when compared to other methods of preservation. It lays a map on the consumer preferences and directs companies to come up with durable and sustainable frozen food packaging products methods.

Europe, the largest market of frozen food, has a share of more than 35.0% in 2019 and was severely hit by the COVID-19 pandemic. According to the government data, more than 50 thousand people have died due to coronavirus including resident of Italy, Germany, France, and Spain till the mid of April 2020. Moreover, the U.K., Belgium, and Netherlands are

also severely hit by this pandemic. This has propelled huge demand for frozen food in Europe amidst this pandemic.

Asia Pacific anticipated to be the fastest growing region with a CAGR of 3.9% from 2020 to 2027 owing to the increasing trend of ready-to-eat food among working-class people and college graduates from countries such as China and India. China, India, and Japan are major market for consumers spending a fair share of their income on food. The rise in demand for frozen food has opened new avenues in the regional market. China was the first country to witness the coronavirus outbreak that resulted in forced quarantine by severely hit provinces of Japan for more than two months. Many other countries followed the same pursuit to maintain social distancing- the most effective way to control the spread of the virus. The sudden change infused positive demand shock for frozen foods in the economy of affected countries. This can cause a positive rise in the demands for frozen foods..

India's frozen food market stood at \$310 million in 2017 and projected a growth of over 16% CAGR to reach \$754 million by 2023, backed by rapidly growing demand from middle class consumers with increasing disposable income. Urbanization, refrigeration facilities in small retail shops and rural households, and growing cold chain industry are expected to significantly contribute towards the growth of frozen food market in the country over the coming years. Moreover, the retail and e-commerce industry are among few other factors anticipated to augment demand for frozen food in India during forecast period.

REGULATIONS ON FROZEN FOOD

- According to Food Safety and Standards (Food Products

Standards and Food Additives) Fifth Amendment Regulations, 2020, Food Business Operators have been asked to comply with all the provisions of the regulations by July 1, 2021.

- In the "Fruit & Vegetable Products" category, the standards for frozen beans, cauliflower, peas, and spinach were included.

As per the regulation for Frozen beans:

1. The product shall be of uniform colour, free from foreign flavour, odour or free from imparted added ingredients.
2. It shall be clean, free from sand, grit and other foreign material and it shall also test negative for Peroxidase.
3. It shall not contain any added colour.
4. It can be whole, cut, short cut, sliced or any other style of presentation is permitted.

As per the regulation for Frozen Cauliflower:

1. The product shall be of reasonably uniform, white or dark cream colour which can slightly be dull and have a tinge of green, yellow or pink colour over the flower surface.
2. The stem or branch portions may be light green or have a tinge of blue colour.
3. The product may be presented in whole, split or florets.

- i. **Whole:** the whole head may remain intact, trimmed at the base or may have small, tender, modified leaves attached to it.
- ii. **Split:** the head can be cut vertically into two or more sections,
- iii. **Florets:** segments of the head, which may have a portion of the secondary stem attached to it, may have modified leaves that are present or attached to the units,
- iv. **Others:** An adequately described

cauliflower on the label to avoid confusing or misleading the consumers.

As per the regulation for Frozen Peas:

1. It shall be of reasonably uniform green colour according to type, whole, clean, and free from foreign matter & damage by insects or diseases.
2. It shall be free from any foreign taste or smell and shall have a normal flavour, taking into consideration any ingredients added.
3. It shall not contain any added colour.

As per the regulation for Frozen spinach:

1. It shall be of a reasonably uniform green colour, characteristic or variety.
2. It shall be free from any foreign flavours and odours other than those imparted by any added ingredients.
3. It shall also be free from fibrous material. The styles of whole leaf and cut leaf shall not materially be disintegrated due to mechanical damage.
4. The product, if in liquid form, shall be free from any dark particles or flower buds that may affect the overall appearance of the product while the product may be presented in

- i. **Whole spinach:** The spinach plant must remain intact but the root may be removed,
- ii. **Leaf spinach:** The leaves may be separated from the root crown,
- iii. **Cut leaf spinach:** Parts of leaves of spinach may be cut into pieces,
- iv. **Chopped spinach:** Parts of leaves of spinach may be cut into small pieces but not presented in the form of a pulp or puree
- v. **Pureed spinach:** Spinach is finely chopped or passed through a sieve.



Mr. P Chandrashekhara Reddy, Vice President Sales & Marketing at Gemini Edibles & Fats has an exposure of over 25 years in various edible oil organisations. In this interview Mr. Reddy shares his direct insights as well as apprehensions on how to promote a launch and understand the business dynamics. His focus and aggressive brand building approach has created a robust network; his strategy has succeeded in positioning Sunflower oil as a No.1 Brand.



WHAT ARE THE DIFFERENT KINDS OF OIL VARIETY YOU PRODUCE?

'Freedom Healthy Cooking Oils' is our flagship brand, widely recognized for the refined sunflower oil. We have added variants like physically refined Rice bran oil, Groundnut oil, Mustard Oil & Gingelly oil to offer the customers an option for the specific requirements.

We have First Klass brand for Palmolein Oil. We also have a range for Value added fats with the brands B.Rite, Magik and Fabula for bakery fats. Apart from this we also do bulk trading of edible oils.

HOW IS YOUR PRODUCT HEALTHIER AS COMPARED TO YOUR COMPETITORS IN THE FOOD INDUSTRY?

India has a diverse culture when it comes to food. Different types of oils are used for cooking across India. Consistency in quality, safety and hygiene are critically differentiated, for any brand in the era of COVID-19. We have also set up a world class

state-of-art refinery, using best of global technology at Kakinada. The entire refining process and packaging is automated and requires minimal human intervention.

Being in the industry for over 2 decades and as a part of Sinarmas group, we have an excellent global network for sourcing the best quality of raw material for processing.

Our portfolio of Freedom Healthy cooking oils has rice bran oil, which is known for its high levels of bio-active phytochemicals, such as oryzanol, tocopherols and sterols. Freedom physically refined rice bran oil is extracted using a novel physical refining process. The process helps retain more than 80% of these micro-nutrients like 10000+ ppm of oryzanol per 100mg in the end product. Therefore, it has the right quantity of oryzanol to help the customers eat healthy and live healthy. We also have sunflower oil, which is fortified with Vitamin A, D & E, Groundnut oil, Mustard Oil with a balanced profile for health.

PEOPLE ARE INCREASINGLY SHIFTING FROM OIL-BASED FOOD TO OIL-FREE FOOD. HOW CAN YOU CONVINCING THEM TO EAT OIL-BASED HEALTHY FOOD?

Consumers are growing health conscious and concerned about the health impact from all the ingredients that are used for cooking. The global trend of 'Fat is Good' in appropriate small quantities is being recognized. Fats, are just as essential for our well-being like proteins, starch and minerals. Edible oil forms an essential part of the food being cooked and is required for the body. To stay healthy a small quantity of fat in the diet is essential, however excess consumption is not good.

'Freedom' has always focused on bringing the customers edible oils which are healthy, and tasty food using less oil. It is non-sticky, non-greasy, with a balanced HDL/LDL profile making it healthy for the heart. The oil helps you cook more in less oil and the same has been

communicated in our messaging over a period of time.

Likewise, Freedom Rice Bran Oil has 10,000 ppm of Oryzanol, highest in any brand of RBO and the same has been the focus of our communication. For mustard oil and groundnut oil we have our focus on the taste and health, due to the niche usage of these oils.

To deliver the message, we use a mix of mediums. We have communicated the health benefits and advice on the consumption of oils through a series of articles featuring nutritionists, chef's etc. through platforms like TV advertisements & programs, news articles, Facebook,

a perception is created that it is bad for health. Probably the lower selling price could be the reason for the notion. Palm olein has helps increase shelf life and enhance taste. However, whether it is in India or around the world Palm is mostly consumed in Industries and HoReCa segment. We have palm oil by the brand name 'First Klass' mainly for this segment.

All edible oils under the flagship brand 'Freedom' like Sunflower, Rice Bran, Mustard and Groundnut Oil are having a favorable health profile and preferred for "@Home" consumption.

WHAT MEASURES DOES YOUR BRAND FOLLOW FOR OPTIMUM

new technologies for production, packing, distribution, monitoring, and control. We have recently set up a new fully automated plant at Kakinada which does require minimalistic manpower, right from sourcing oils for refining, monitored refining, packing for dispatch.

This lockdown has witnessed the emergence of the requirement for less contact manufacturing and distribution processes. Even, the bottles are manufactured in-house for packaging, whereas labour is only required during the shipping of products. This has helped us during the COVID-19 lockdown. Even the internal sales and billing monitoring system is completely



'FREEDOM' IS EXTREMELY CONCERNED ABOUT THE ENVIRONMENT AND THE COMMUNITIES WHERE WE OPERATE. OUR NEWLY COMMISSIONED PLANT @ KAKINADA IS A ZERO-DISCHARGE FACILITY WITH MULTIPLE INTERVENTIONS TO PROTECT THE ENVIRONMENT.

Instagram and YouTube posts. We have also associated with running and sporting events like Freedom Hyderabad 10K Run, Freedom Ride, HYSEA Sports tournament to re-enforce the association with health.

YOUR BRAND USES PALM OIL. PALM OIL IS SAID TO HAVE A BAD REPUTATION BECAUSE IT IS HIGH IN SATURATED FATS. WHAT CAN YOU SAY ABOUT IT?

Palm olein is the largest selling fat in the world. Unfortunately,

HYGIENE PROTECTION WHILE PACKAGING THE PRODUCTS, ESPECIALLY IN THIS PANDEMIC SITUATION?

Safety and Hygiene of Freedom Healthy Cooking Oils has been the focus for our brand since its launch. We follow a very stringent hygiene and quality control mechanism at Freedom. Each batch of oil undergoes 24 specified tests and 100 periodic tests to ensure the quality. As we navigate this new normal, organizations are forced to evaluate their business processes and adopt

automated. The automation helps us keep ourselves updated about the stock movement across different categories of retailers and on the efforts of the sales force.

WHAT IS THE VISION FOR YOUR BRAND?

'Freedom' is a value for money brand offering genuine, pure, best quality of food products. We are currently in states of AP, Telangana, Orissa, Karnataka and as we go along, we would like to make in-roads in the neighboring states.

As of now, we want to focus on edible oils with the brand – 'Freedom'.

HOW DOES YOUR BRAND CONTRIBUTE TO THE SUSTAINABLE ENVIRONMENT AS A PIONEER IN THE FOOD INDUSTRY?

'Freedom' is extremely concerned about the environment and the communities where we operate. Our newly commissioned plant @ Kakinada is a zero-discharge facility with multiple interventions to protect the environment. We have invested heavily in technology & infrastructure to ensure that our manufacturing plant has zero liquid effluent discharge, unlike most of the other industry operators.

We ensure adequate green belt patches within the premises and enough measures are taken to maintain a clean environment around the plant.

WOULD YOU LIKE TO DEBUNK A FEW OIL PROCESSING MYTHS THAT RELATE TO THE HEALTH ISSUES TO THE CONSUMERS & THE FOOD INDUSTRY?

It is important for all the consumers

to understand the various aspects of products, safety and edible oils - myths & facts. All the consumers should know the different aspects about edible oils comprising of its importance in diet, to selection of oils, the safety of refined oils and the logic of importing oils and its pricing. Cooking/Edible oils are important for the maintenance of good health. These are energy-rich components in our daily food and provide about 9 kcals/g whereas carbohydrates and proteins provide only 4 kcal per gram.

FSSAI has recognized several oils for cooking purpose and some of the most common cooking oils being consumed are as follows: Coconut oil, Cottonseed oil, Groundnut oil, Linseed/flaxseed oil, mustard oil, Rapeseed or mustard oil - low erucic acid, Olive oil, Palmolein, Palmstain, Palm kernel oil, Rice bran oil, Safflower seed oil, Til Oil (Gingelly or sesame oil), Soybean oil, Maize (corn) oil, Sunflower seed oil and High Oleic Sunflower seed oil. Majority of these oils require refining. We use only standard and approved ingredients for refining as recommended by FSSAI, ensuring the safety and well-being of the consumers.

BRANDS CAN NOW EFFECTIVELY COMMUNICATE WITH CUSTOMERS THROUGH B2C COMMUNICATION METHODS. HOW DO YOU FIND THIS TO BE REWARDING FOR YOUR BRAND?

Being a vibrant player in the segment, Freedom pioneered the adoption of Social Media Marketing, Influencer Marketing & Digital Advertising as a new medium to reach out and engage with the target audience. Digital marketing is essential to reach out and engage with the audience today, as India is rapidly adopting mobiles and using it increasingly to stay connected. We are spending with specially conjured creative content majorly on Google Apps, YouTube, Face book, Instagram & other platforms as well. This year we have also started with the OTT (Over the Top) Platforms like Zee5 & Hotstar.

Freedom has been communicating to its customers through the different platforms with the different narratives over the last many years by segregating the customers through their Lifestyle needs, culture and on the interpretation of Freedom to Choose.



Mr. Piyush Pattnaik, Managing Director at Cargill Oils, talks about his new relaunch in the bakery industry and how it will benefit the bakery industry and also home bakers. He has always worked for the benefit for consumers and towards making their experience memorable. The relaunch was initiated to bring multispecialty benefits i.e to have one product with multiple usage.

India is a market with multiple demands and needs. As a brand, we have always believed in providing nothing but the best to our customers. In line with our commitment towards our consumers, we relaunched the Nature Fresh Multispecialty fat LITE. Lite is a multipurpose premium specialty fat which can be used to bake all types of prevalent applications like cookies, cakes, butter cream & also the exotic ones like Danish Pastry, Brownies, croissants, fudges, etc. Currently, the fats which are being used by bakers are single application centric and meant for one application i.e. a cake, cookie, or a puff. But this fat is capable of baking with multiple applications, which a baker would love to have in their basket. The fat also takes the output of final baked product a notch higher in terms of mouthfeel, taste, texture, and aroma along with a slight buttery taste to it.

CARGILL INDIA IS RELAUNCHING NATURE FRESH PROFESSIONALS MULTISPECIALTY FAT LITE FOR VEGAN BAKING PRODUCTS. IN THIS PANDEMIC SITUATION, COMPANIES ARE FINDING IT HARD TO LAUNCH NEW PRODUCTS. HOW WOULD YOU LIKE TO POSITION YOUR NEW LAUNCH FOR THE BAKING INDUSTRY?

HAVE YOU REDEFINED YOUR PRODUCT TO ADD MORE BENEFITS TO THE ALREADY EXISTING INGREDIENT IN THE MARKET?

The rationale for this new launch comes keeping consumer preferences at the center point. The product can be used for diverse and multipurpose applications. It not only enhances the finesse of the final product due to its premium quality, but also ensures even creaminess with right consistency in the product. The low melting point of the fat makes it suitable for the trending application of the

healthy constituents like granola bars, gluten-free cookies, banana breads, etc. Currently, this is one such fat available in the country which delivers a subtle buttery flavor to the finished product. The fat is yellowish in color, which gives a golden-brown finish to the end product.

Q **DUE TO COVID-19, THE SUPPLY LOGISTICS OF THE BAKERY INDUSTRY HAVE BEEN LARGELY IMPACTED. THIS HAS BEEN A CHALLENGING PHRASE FOR THE BAKERY INDUSTRY IN INDIA AS WELL. HOW WILL YOUR PRODUCT ADD VALUE TO MANUFACTURERS IN THE BAKERY INDUSTRY?**

The pandemic caused several changes in market and consumption patterns. In the past 6 months, consumption of baked goods has increased drastically. We have observed high demand for baked items from the end users of snacks and bakery items. There has also been significant rise in demand from households. Our manufacturing plants have state of the art manufacturing facilities which ensures prolonged freshness in the end product. This product can produce popular, premium as well as exotic bakery items as per individual preferences. In addition to this, the Cargill Chef Team has curated more than 20 recipes for the Lite Brochure from this product and distributed amongst the baker communities.

Q **WHAT BENEFITS DOES YOUR PRODUCT ENTAIL FOR A COST-EFFECTIVE BRAND?**

With this new product launch our aim is to provide bakers with high quality and cost-effective bakery products. The high-end premium applications like Croissants, American Spreadable Cookies which were earlier possible through butter only, can now be done with similar or better outcome with NatureFresh Professional Lite at almost half the cost.

Q **WHY DO YOU THINK THIS IS THE RIGHT TIME TO RELAUNCH A PRODUCT WHICH HAS ALREADY EXISTED IN THE BAKERY INDUSTRY?**

Two things significantly stand out in this relaunch. Firstly, with the changing consumer preferences, consumers of bakery products are looking for more premium products on the shelf, owing to increasing western influence and a growing

cosmopolitan culture in the country. Secondly, post the pandemic, health and hygiene are top priority for consumers. Being a cholesterol-free fat and having an excellent melting profile - lower than the body temperature, makes it a preferred choice. As home-baking culture is evolving at a very fast pace in our country, this product adds to the dexterity of the homemade bakery products. Nature Fresh Professionals Multispecialty fat LITE is our only fat that is available in 1 Kg pack and since it is already listed on Amazon, it is easily available for home-bakers being just a click away.



Q **WHAT GROWTH ARE YOU AIMING FOR WITH THIS LAUNCH?**

We have received encouraging response from the bakers. They are amazed by the premium quality and multipurpose use of the product and are also coming out with their own usage and application. This makes it a great learning experience for us as well. We aim to see around 30-40% growth this year. We are also hoping that not only professionals, but people staying indoors can fuel their love for baking and cooking by gradually adopting this product and using it for delicacies.

Q **YOU HAVE WORKED WITH DIFFERENT BRANDS AND HAVE WITNESSED THE CHANGE IN THE FOOD INDUSTRY. HOW DO YOU THINK THE FOOD INDUSTRY HAS EVOLVED OVER THE YEARS?**

Trends in the food industry have significantly altered, especially during the last six months. While countries across the globe are battling the global pandemic, businesses, especially sectors like the food industry have a bigger battle to win by staying afloat and providing for consumers. As we adjust to the new normal, a rise in healthy food choices has been observed amongst the masses. Hence, it is imperative that brands like us, come up with healthier and hygienic food options for the people. We have also observed a drastic shift in consumption patterns, consumer behavior and increased demands of goods that subsequently influences trends in food production making it very critical for brands to launch a product that will qualify on the consumer checklist without compromising on its premium quality and authenticity.

Consumer preferences shaping the post-pandemic bakery industry

Food Marketing & Technology Magazine attended a recent webinar hosted by the Mintel's on "Consumer trends shaping India's biscuits and cookies category". The webinar talked about the changes in the Bakery Industry post-pandemic. Food & Drink Analyst Rushikesh Aravkar assessed the current changes in the consumer demand graph and also how it is going to open new opportunities in the food industry.

An 86% hike is analyzed in the consumption of biscuits and cookies consumed at least once a week. During the lockdown, the consumption rate has been on an all-time hike without any dip in the curve. This has proven to be a relief for the bakery industry. Post-pandemic demand for bakery products consumed did not diminish as manufacturers continued to witness a significant rise in demand.

The study conducted by Mintel's suggest that over four in ten people consume seven or more varieties of biscuits or cookies products. This includes choices preferred by the younger generation who tend to consume varieties. The potential exists only when manufacturers in the industry track down the economic effect caused by external changes.

Marie biscuit, one of the largest producers of biscuits, is consumed by a large number of the Indian population. During the COVID-19 situation, many people have switched to making a healthy



choice, even in biscuits. Healthy biscuits are said to have over 50% market penetration. Consumers in metropolitan cities are more inclined to choose healthy alternatives. It is often assumed that healthy is not tasty. Hence, the idea of healthy can be tasty can help break unseen barriers in the bakery industry. People are now more inclined towards choosing healthy biscuits alternatives over ordinary ones, yet a healthy and tasty alternative, as a combo, is preferred over any other option, if found with multiple-choice options.

Biscuits with all-in-one ingredients are said to have more benefits and demand in the eyes of the buyers. Therefore, it is suggested that manufacturers must aim at producing biscuits with all-in-one ingredients to be listed under the healthy indulgent category.

If consumer demand is broken in the analytical term, then a cookie or biscuit has over 40% healthy ingredient, 39% health benefits, and 31% whole grains. Yet less than 7% of manufacturers launch a product with any whole grain flavor or ingredient in it. Such as Iron Shakti,

a rich source of bajra, and fox millet, a rich source of calcium are some brands that emphasize the health benefits of their product.

In this growing world, where external environment is not quite apt for health, people are increasingly moving towards the intake of healthy alternatives to keep themselves fit from inside. However, too much of anything is not good for your health.

Weight management biscuits or cookies can lead people to pursue bad and harsh diets that can increase hidden hunger in the body. According to Mintel's, less than 20% population carries weight management biscuits, which is still high but can be curbed. Hence, the biscuit manufacturers must be careful in the fortification of ingredients in biscuits and keep them at the right levels. As metabolic rate increases so do the calorie burn, the deployment of high proteins, fibre, and other nutrition in biscuits can help in healthy weight management.

The equilibrium between Satiety and wealthy management system can be established with the help of biscuits

that have a good amount of dietary fibre. Britannia Nutri Choice has high fibre content that helps kick-start the day without filling empty for long hours. Preferred as an added supplement for breakfast by over 60% of people in India because of its potential prospect for boosting immunity.

Indulgent biscuits are another category of biscuits famous among the younger generation. They have a high rate of inclination by the consumer.

Over 72% of the young generation between the age of 18-34 are involved in indulgent biscuits. Indulgent biscuits are hovering a wave that can create huge growth in India. Cream biscuits have limited

consumption choices. Yet, 45% of chocolate-flavoured cream biscuits are consumed by the younger generation. Further, caramel is often used by the consumer to bake flavored cookies at home.

Biscuits are consumed by over 26% to relieve stress and offer good sleep. It is recorded that consumers before bedtime usually prefer tulsi, cumin seed, and other freshly baked flavoured cookies over any other flavored bakery product.

OPPORTUNITIES

Freshly baked cookies or biscuits are preferred to be consumed during waking hours over stale or indulgent biscuits. The bakery industry has soared well during the lockdown period caused because of the global

pandemic. As per the consumer preference curve, a boom can be seen in the indulgent biscuits category. This can be taken as a niche by the upcoming entrepreneur who aspires to hold a bakery business because of its perpetrating demand for indulgent biscuits among the younger generation.

Also, tackling the perception of healthy can be tasty is important so that consumer preference can be driven to healthy, yet tasty biscuits or cookies. The myth that is often carried out of healthy can not be tasty must be overpowered by brands introducing healthy and tasty as a combo. Biscuits infused with zinc, calcium, magnesium, whole grains can act as a game-changer for the industry.

IMPRESSUM FMT

Publishing Company

L.B. Associates (Pvt) Ltd

B-4/148C,
Safdarjung Enclave
New Delhi - 110029
Website: www.lbassociates.com

Publisher

Linda Brady Hawke

Marketing & Events

Binoy Sahee
info@lbassociates.com

Neenu Choudhary

+91-8744069171
contact@lbassociates.com
info@fmtmagazine.in

Editor

Kanchi Batra
kbatra@lbassociates.com
fmteditorial@lbassociates.com

Copy Editor

Shreya Mukherjee
fmteditorial@lbassociates.com

Legal Consultant

Roopa Somasundaran

Layout & Design

Atul Kumar

Subscription

sales@lbassociates.com
+91-7827892179

Parent Company

Dr. Harnisch Publications
P.O. Box 90328 Nuremberg, Germany
Email: food@harnisch.com
Website: www.harnisch.com/fmt

NOTE: Key numbers at the end of articles can be used as references for reader requests

DISCLAIMER: The views and opinions expressed in *Food Marketing & Technology, India* are solely those of the authors and do not necessarily reflect those of the editors or the publisher. Although all efforts have been made to ensure the complete accuracy of text, neither the editors nor the publisher can accept responsibility for consequences arising from errors or omissions or any opinions or advice given.



National Events Calender

ANUTEC - INTERNATIONAL FOODTEC INDIA

03-05 February Mumbai

