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इंडिया

FOOD AND BEVERAGE TECHNOLOGY

INGREDIENTS

28 SCIENCE OF PICKLING



PROCESSING

34 PROCESSING OF PASTEURIZED MILK

PACKAGING

52 PEEL-OFF MADE EASY IN ANY CASE



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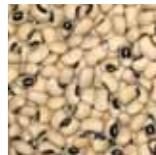
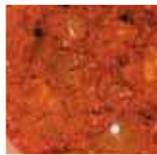
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At Gandhi Automations, we strive to provide sustainable solutions that do not only emphasizes on durability and long life but also on the safety of material and people.

These doors are apt for operation and installation in the food logistics, food processing, food warehousing and food retail industries.

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Innovative Natural Methods in Food Processing

One current recurring topic in the international food industry is naturalness. This refers to ingredients such as flavourings and colours, but also functionality, health and wellness and processing methods. To underline this naturalness it is important to protect the integrity of individual products. Encapsulation is one of these methods, as are granulation, agglomeration, coating and instantizing.

Customizing functional food ingredients – disguising taste or smell, protecting against moisture or oxidation – is often done through fluid bed granulation. This means that liquids with a high solid content are sprayed into a fluid bed through a jet system. Controllable temperatures give an intensive heat and material exchange enabling a uniform drying process without thermal damage. In this way the nutritional characteristics of foodstuffs remain intact – and the shelf-life can be increased. As well as producing excellent powder products, milk and whey-based proteins concentrates also arise. The extracted powders have optimum flow behaviours and need no additional carriers or additives, thus keeping the ingredient list short.

Other multi-functional processing systems can do even more: they can also integrate vitamins, minerals and aromas into a stable matrix. A micrometre thin layer comprising maltodextrin and starch efficiently protects ingredients which are sensitive to oxidation against outer influences. Microencapsulation has the extra benefit that the contents are only released as food is consumed. This means, for example, that grains of salt can be concentrated and are thus perceived to be more intense; put a different way: the same taste effect can be achieved with up to 20% less salt, saving raw material and meeting current consumer trends.

Naturalness is a decisive buying factor on supermarket shelves. The processes for getting to these finished products are as important as the ingredients selected to reflect this trend. Using the right technology it is possible to satisfy consumer wishes in areas such as clean label and personalized nutrition, whilst at the same time reformulating foods to achieve lower sugar, salt or fat, all in a natural way.

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Stepping into a New Year with hopes of peace and prosperity

Welcome to the New Year as the old one beautifully wrapped itself. FMT wishes all of its respected readers, associates and partners a happy and prosperous New Year. At FMT, we are proud of our reporting in 2019, busy with big plans for 2020 and appreciative for the support of our readers.

Honestly, I'm not really one to make New Year's resolutions, since I think every day is a perfect day to start living a better life. I'm not plugging any quick shots for contentment or weight loss. My hope for you in the New Year is that you can truly concentrate on what means most in life. Someone has rightly said, "Our life is like a jar. If we fill it with sand, there's no room to place rocks in it. But, if we put the larger rocks (more important things of life) in the jar first, then we can add sand (less significant items) later."

As a new year and new decade offer prospects and opportunities to take stock of where we have come and to anticipate the changes ahead, we are constantly getting a myriad of predictions and trend forecasts from various sources in the world. Though this year's trends will build on a lot of the development areas the industry has already seen, innovation could dramatically shift what companies produce over the next twelve months and beyond.

Trends towards health and wellness, plant-based and clean label will continue this year as well, but the necessity for food business to revolutionise is greater than ever.

In 2020, there are some big dynamics we will be keeping our eye on that could have major implications for the food industry well into the future. We shall pull ideas from thought leaders and combine them with data from surveys and present it to you in the upcoming editions.

Linda Brady Hawke



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Contents

January 2020

Ingredients

- 22 Let food be your medicine - Amla (Indian Gooseberry)
- 24 Flavor Trends for 2020: Multicultural, Plant-Based, Nostalgia
- 26 High Protein Claims Can Help Reduce the Negative Image Associated with Sugar Confectionery
- 28 Science of Pickling, Explained!
- 30 Recent Advances in Dehydration of Fruits and Vegetables



Processing

- 32 The Chemistry of Food Colourings
- 34 Processing of Pasteurized Milk
- 38 Powder Processing Solutions for Plant-based Protein in Research & Development
- 40 New Digital Sorters for Gummy Candies Introduced



Packaging



- 50 Individual and Ecological: New Wide-Neck PET Containers for Hot Filling Developed
- 52 Peel-off Made Easy – in Any Case
- 53 More Emotionality and Greater Differentiation



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FDA MAHARASHTRA DRIVE AGAINST WRONG CLAIMS; SEIZES RS 69 LAKH PRODUCTS



Food & Drug Administration Maharashtra recently carried out a special drive against products of renowned food manufacturing companies, which have been violating norms specified in the Food Safety and Standards Act, 2006, by making wrong claims for luring buyers. According to a press release issued, the Intelligence branch of FDA, along with local area officers, carried out the raids at cold storages located at various places and found Nutralite Fat Spread product of Zydus Wellness Pvt. Ltd and products belonging to Gujarat Co. Op Milk Federation i.e., Amul Lite and Delicious, both under the Fat Spread category. Both the products endorse wrong claims Like “Zero Cholesterol” “Low Fat, Low Cholesterol” which do not match with standards given in the Schedule I (Nutritional Claims) of Advertising & Claims Regulations 2018 of FSS Act, 2006. To mention such type of claims, the product should be free from cholesterol and saturated fatty acid level should be restricted to 1.5gm/100gm of products. In these cases, products are having a much higher amount of saturated fats i.e., above 35gm/100, which clearly violated said regulations.

- In the case of Nutralite Fat Spread product claims “Naturally Zero Cholesterol” but it contains 35gm of saturated fats
- In the case of Delicious Fat Spread product claims “Zero Cholesterol” but it contains 37gm of saturated fats
- In case of Amul Lite Fat Spread product claims “Low Fat, Low Cholesterol” but it contains 37 gm of saturated fats

After drawing the samples for analysis stock of food products (Amul Lite, Delicious and Nutralite Fat Spread) worth Rs 69,34,232 was seized and kept in the custody of food business operators.

INDIA'S 2020 WINE PRODUCTION TO FALL BY ABOUT 20%

Wine production in India may fall 20% in 2020 owing to the reduction in the availability of grapes following the erratic monsoon last year, said, industry executives. Wine sales have remained flat for big players while the rest of the industry has reported a 30-40% decline year-on-year for the first three quarters of this financial year mainly due to the economic slowdown. Industry leader Sula reported no growth in overall sales for the first three-quarters of the current fiscal. “Overall sales during the nine months of the current fiscal that ended in December remained flat. We are happy that the top end of our portfolio, which is the future of our business, had positive growth,” said Karan Vasani, senior vice president, Sula Vineyards. Yatin Patil, president of All India Wine Producers’ Association, said: “This year, wine sales have been down after the first quarter. The second and third quarters were particularly bad. October to December is the peak season for wine sales. But there was no season at all.” Despite extending various schemes to push sales, wineries could not succeed much in getting consumers during the festive season. “Though sales at my own wineries grew nicely, overall wine sales have reduced due to the economic recession in the country,” said Pradip Pachpatil, president, Nashik Valley Wine Producers’ Association. Pachpatil has set up a boutique winery called Somanda Vineyards next to Sula Vineyards in Nashik.



LABOUR COMMISSION TO LOOK INTO STAFF UNREST AT COKE PLANTS

The Labour Commission will try to resolve the stalemate in some Coca-Cola bottling plants in North India due to employee unrest following the leading beverage maker's decision to divest its plants to independent franchise bottlers, two officials aware of the developments said. The matter came to the labour and employment ministry's purview after employees at some of Coca-Cola's biggest plants in North India said they were not informed prior to the sale that they would no longer be Coca-Cola employees, and instead be transferred to work with independent bottlers. Operations at Coca-Cola's Dasna and Varanasi plants have been suspended due to the unrest, the officials said. Coca-Cola had announced the sale of some of its plants in North India to franchisee bottlers last month. Workers have come up with a set of demands, the officials said. "The workers' demands included job guarantees, security against job losses, compensation if the workers want to opt-out to work with the independent bottlers and settling pending dues," one of them said. A Coca-Cola spokesperson claimed that the company did take care of the interest of the workers while selling the plants. "The workers remain valued members of the Coca-Cola family, and the local bottlers have committed to ensuring their pay and benefits remain unchanged," the person said in an email revert. The realignment optimises existing capacities, supply chain, brings further investments and improves distribution routes through contiguous territories, the spokesperson said.



RELIANCE SETS UP JIOMART TO SELL GROCERY ONLINE SOON

Reliance Industries, India's biggest company by market value, has started its web portal Jiomart, harnessing the might of its two largest consumer-facing businesses to announce its entry into online food and grocery shopping by early next year. The app will connect both last-mile neighbourhood stores and consumers, leveraging data and technology capabilities of Reliance's telecom business Jio and the cash-and-carry infrastructure of its retailing arm. According to officials, the new venture will be an aggregator where it will partner local grocers and equip them with points of sale (PoS) terminals, low-interest working capital, inventory management skills, and GST compliance. In January 2019, chairman Mukesh Ambani announced that group companies Reliance Retail and Jio would jointly launch a new eCommerce platform in the country. At present, services of the website with the tagline 'India ki nayi dukaan' are available in the outskirts of Mumbai, in suburbs such as Thane, Kalyan and Navi Mumbai. The site offers free home delivery, pre-registration discounts and options to buy more than 50,000 grocery products online. "Kiranans are being registered and given POS machines with integrated billing applications. Also, it enables digital transactions, promotions including loyalty, discount coupons by fast-moving consumer goods firms and supply chain management," said an official privy to the launch of the service.



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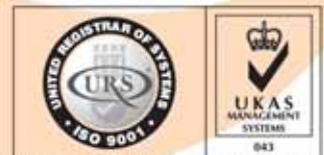
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“Load yourself with Vitamin C and not Stress”

■ By Anusha Mishra, M Salman Chukkan, Prof. Uday S. Annapure*

Micronutrient deficiencies affect more than two billion people of all ages in both developing and industrialized countries. Indian Gooseberry/Aonla/Amla scientifically named as *Emblica Officinalis*, is the richest source Vitamin C/ Ascorbic acid (an essential water-soluble micronutrient) among a wide variety of fruits and vegetables. They work together with enzymes and other substances for sustaining a healthy life. The harvesting period of amla is November to December, however, fruits may remain on the tree until February until fruit drop. Amla is native to India and is also grown in tropical and subtropical regions of Pakistan, Uzbekistan, Sri Lanka, South East Asia, China and Malaysia. In India, as per National Horticultural Board Data (2017), Uttar Pradesh is the largest producer of Amla followed by Madhya Pradesh and Tamil Nadu.

The fresh fruits are generally not consumed due to their high astringency but it has got great potential in processed forms. Recommended Daily Allowance of 40 mg is met by consuming an average-sized amla. Even after prolonged heating or drying conditions, amla is highly stable. It contains a high percentage of polyphenols that prevents the oxidation of ascorbic acid. It has a special mention in Ayurvedic and Unani system of Indian medicines. Various kinds of phenols like gallic acid, ellagic acid, flavonoids like quercetin,

kaemferol and hydrolysable tannins Emblicanin A and B are largely present in amla. Total tannin distribution of fruits accounts for 28% of the entire plant. Amla is an exception among fruits, not only because of its high initial ascorbic acid content but also it contains polyphenols, leucoanthocyanins, tannins and antioxidants which protect the ascorbic acid destruction.

S No.	Composition	Amount per 100g edible portion
1.	Vitamin C (Ascorbic acid)	252mg/100g
2.	Moisture	87.02
3.	Protein	0.34 / 100G
4.	Ash	0.34
5.	Total Fat	0.16
6.	Total Dietary fibre	7.75
7.	Carbohydrate	4.39
8.	Energy	99 KJ

As per Indian Food Composition Table 2017

This comprehensive vitamin plays several important functions in the body. It is an essential micronutrient for the synthesis of collagen (major structural protein

of connective tissue. Vitamin C is essential for hydroxylation for collagen formation. It is required for the formation of bones, teeth and capillaries and faster healing of wounds. Iron is best absorbed in the body as a ferrous ion. Therefore, vitamin C acts as a reducing agent to prevent the conversion of ferrous form into ferric and facilitate absorption. It also helps in the storage of iron in the liver as ferritin. It helps in the synthesis of carnitine, which aids the transport of fatty acids into mitochondria. It helps in the activation of hormones like oxytocin and calcitonin in the body. Vitamin C even reduces heavy metal concentration in the body, prevents the risk of cataract formation. It is the source of natural antioxidants. It combines with and scavenges free radicals and excrete them out of the body. Regular consumption inhibits the growth and spread of various cancers like breast, uterus, pancreas, stomach and liver cancers. Vitamin C helps in calcium absorption by preventing the formation of insoluble complexes. It helps in controlling several conditions like diabetes, cough, asthma, bronchitis, eye-related disorders, dyspepsia (Indigestion), colic, flatulence, hyperacidity, peptic ulcer, skin diseases, leprosy, inflammations, anemia, emaciation, liver disorders, jaundice, diarrhoea, dysentery, hemorrhages, leucorrhoea, menorrhagia, cardiac disorders, intermittent fevers and greatly prevents greying of hair. It even leads to healthy and glowing skin.

DEFICIENCY DISORDER DUE TO VITAMIN C

The most severe form of deficiency is Scurvy, which is rare throughout the world. The symptoms include fatigue, weakness, shortness of breath, muscle cramps, pain in bones and joints. Other clinical features include gingivitis (bleeding gums and spongy swelling of the mucous membrane), small hemorrhagic spots, arthralgia (pain in the joint) and anemia. Lack of fresh fruits and vegetables in the diet and faulty cooking practices are the major responsible factors.

OTHER SOURCES

It occurs widely in plant foods particularly in fresh fruits and vegetables especially green leafy vegetables. Guava, orange, lime, Barbados cherry are the other good sources.

Patients with kidney stones or renal insufficiency are advised to restrict Vitamin C rich food. They need to consult a nutritionist and doctor for the appropriate amount that can be consumed.

A wide range of value-added products are prepared from amla. The dominant ingredient of the bioactive formula called Chawanprash (a potent antioxidant paste, prepared through the blending of around 50 herbs and spices) is composed of Amla. An extremely

ICMR Recommended Dietary Allowance for Vitamin C in the body

Group	Vitamin C (mg/day)
Manw	40
Woman	40
Pregnant	60
Lactating	80
Infants (0-12 months)	25
Children	
Boys	40
Girls	40

popular traditional product known as amla preserve, which is also known as amla murabba in India, has been consumed since time immemorial. Amla Candy/ Fruit candies have gained popularity because of its high acceptability, minimum volume, higher nutritional value and longer storage life. These have an additional advantage of being least thirst provoking and ready to eat snacks. Amla Jam is prepared from fruit pulp (50%) and 67% sugar. Other fruits can also be added to it. This nutritionally rich jam attracts adults as well as children. Amla Sauce can also be prepared and enjoyed with various delicacies without guilt. Amla Pickle and chutney can be freshly prepared and consumed as part of our daily diet without adding any preservatives. Amla powder can be added to various dishes or consumed directly with water. Ready To Serve beverages (RTS) are prepared with Amla in combination with other fruits to enhance its vitamin C content.

Therefore, Amla as a potential source of Vitamin C plays a crucial role in overcoming micronutrient deficiency, called "hidden hunger", as enough calories from carbohydrate, protein and fat alone won't help for smooth physiological and metabolic functions of the body. Nutritional deficiencies can be minimized by consuming an optimal and balanced amount of food and improving our day to day lifestyle and adequate physical activity.

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Flavor Trends for 2020: Multicultural, Plant-Based, Nostalgia

As consumers continue to seek healthier, better-for-you products, plant-based foods and beverages are inundating the market with no signs of waning and sober curious consumers are exploring low and no alcohol beverage options. The younger demographics continue to explore multicultural flavors with a current cultural affinity for Asian flavors while the popularity of raw cookie dough has remained prevalent as consumers enjoy nostalgic treats.

In response to the consumers' evolving behavior, Comax Flavors

introduces the 2020 Flavor Trends divided into four unique flavor collections. Plant-Powered Snacks capitalizes on consumers' quest for better-for-you plant-based foods and the trend to snacking while No Proof Needed addresses sober curious consumers' interest in low and no alcoholic beverages. Asian Influences taps into the growing younger demographics' attraction to Asian flavors driven by unique colors and textures while So Doughlicious focuses on consumers' appetite for nostalgic indulgence. Each Comax Flavor collection is comprised of a variety of food and beverage

applications such as plant-based applications, snacks, non-alcoholic and alcoholic beverages, beverage syrups, dairy, ice cream, confections, baked goods, and nutrition and performance products.

PLANT-POWERED SNACKS

According to Innova Market Insights, there was a 17% increase in the growth of snacks with a health claim in launches between 2013 and 2017 and a 22% rise in those with a nutritious claim. Launches with plant-based ingredients grew at a 44% CAGR during the period. Furthermore, 80% of consumers are willing to pay more for snacks with health attributes, according to the Hartman Group's The Future of Snacking Study. "To address consumers' insatiable quest for better-for-you plant-based foods, Comax created the Plant-Powered Snacks collection formulated for a variety of snacks," states Catherine Armstrong, Vice President of Corporate Communications for Comax Flavors. This plant-based collection is vegan, kosher and can be used in all plantbased applications.

Flavors in this group include:

Maple Bacon Ranch, Honey Sriracha, and Lemon Truffle

NO PROOF NEEDED

According to IWSR, bottled low and no alcohol beverages in the U.S. will grow by about 32% between 2018 and 2022 - triple the category's growth over the previous five years. This growth is evidenced by consumers' changing behavior. According to Morning Consult data, nearly half of consumers, regardless of age,



have purchased non-alcoholic alternatives, and just over four in 10 of the drinking-age population does not drink. "Individuals are cutting back on drinking for a variety of reasons and many are looking for low or no alcohol beverages with fewer calories, less sugar, and better-for-you profiles. To meet the growing demand, Comax Flavors created the No Proof Needed range," says Armstrong. This spirited collection can be used in numerous applications such as low proof alcohol, non-alcoholic beverages and beverage syrups, as well as dairy applications and confections.



Flavors in this group include:

Matcha Pineapple Punch-less, No-Geroni, and Mango-No-Tini

ASIAN INFLUENCES

The younger generation continues to crave adventurous and authentic global flavors and share their discoveries on Instagram as well as other social media sites. Attracted to unique flavors, colors, and textures, there has been a boom in Asian food and beverages. According to Foodable Research Labs, Asian



flavors on menus at fast-casual restaurants are up nearly 30% year over year. Furthermore, millennials have increased menu consumption of Asian flavor-based menu items by more than 12% year over year. "Comax recognizes the younger generations' desire to experiment, explore global flavors, and broadcast their experiences on social media. In response, Comax has created the Asian Influences collection inspired by trending food and beverages," notes Armstrong. This Asian inspired, multicultural flavor collection can be used in several applications such as non-alcoholic and alcoholic beverages, beverage syrups, dairy, ice cream, baked goods, and nutrition and performance products.

Flavors in this group include:

Milk Tea, Japanese Pancake, and Ube Vanilla

SO DOUGHLICIOUS

Eating raw cookie dough is a nostalgic act and thanks to

pasteurization and heat treatment, 2017 was the breakout year for safe, edible raw cookie dough. Regardless of age, edible cookie dough continues to excite adults and children alike. According to Technomic's MenuMonitor, cookie dough is seeing a 9% year over year growth on restaurant menus while the cookie category increased 2.6% to reach \$8.8 billion for the 52 weeks ending March 24, 2019, according to IRI data. "Whether raw or baked, consumers of all ages have a soft spot for cookies and Comax created the So Doughlicious assortment as a nod to childhood," says Armstrong. This comforting and nostalgic collection can be used in a variety of applications such as dairy, ice cream, baked goods, nutrition and performance products, confections, non-alcoholic and alcoholic beverages, and beverage syrups.

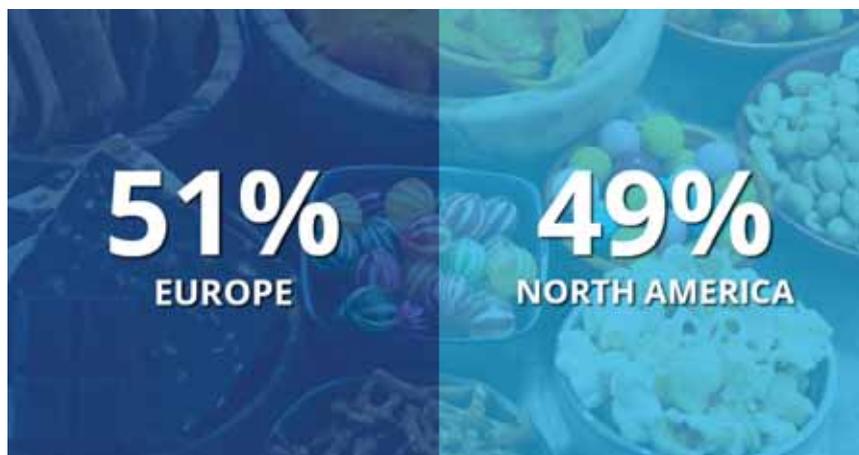
Flavors in this group include:

Birthday Cake Cookie Dough, Cold Brew Coffee Cookie Dough, and S'mores Cookie Dough.

High Protein Claims Can Help Reduce the Negative Image Associated with Sugar Confectionery

Eating and drinking habits are changing across the globe. This is being driven by health-conscious consumers taking a more proactive approach. This is something that is having an impact on product categories associated with high sugar content, such as the confectionery industry, with their being a greater focus on moderated consumption. As consumers make the switch from traditional snacking options, the sugar confectionery industry needs to respond with better-for-you options positioned around high protein.

Health-conscious consumers are changing their snacking habits, and this is something that is having implications for traditional snacking categories such as confectionery. In Q3 2019, FMCG Gurus surveyed 26,000 consumers who are taking a proactive approach to health maintenance across twenty-six different countries. The research found that in the last two years, 39% of consumers said that they have looked to improve their diets. This attitude was noticeably more apparent in North America (52%) compared to Europe (37%). This is something that is having a profound effect on snacking occasions.



Indeed, a total of 25% of consumers say that they have reduced the amount of confectionery that they snack on in the last twelve months.

Additionally, a total of 51% of consumers say that they have made conscious efforts to switch from traditional snack products such



as chocolate and confectionery to high protein/low sugar alternatives instead. Consumers in Europe are marginally more likely to say this than those in North America (51% versus 49%).

This is something that will have implications for the confectionery industry and any negative attitudes towards the category can be linked to concerns about excess sugar intake. For instance, when it comes to satisfaction with aspects of health, only 27% of consumers say that they are satisfied with their waistlines. Moreover, 49% of consumers say that they have actively looked to reduce sugar intake, with consumers in Europe more likely to say this compared to their counterparts in

North America (51% versus 42%).

As a result of this, the confectionery industry needs to look for ways to target healthier snacking occasions. A key way of doing this is through fortifying products with protein so that they are genuinely nutritious. This will appeal to consumers who like to enjoy moments of indulgence and can express concern with the sensory appeal of high protein snacks. For instance, a total of 44% of health-conscious consumers say that they like to enjoy moments of indulgence regularly, whilst 32% admit that they find healthy food to be bland and boring. When it comes to high protein snacks, a total of 53% say that they can be concerned about the aftertaste of products

(53% in Europe versus 55% in North America), whilst the texture of such products can be a concern to 48% of people.

The reality is that over the next decade consumers will continue to become more health-conscious. This is something that will further impact on the image of sugar and categories associated with excessive intake. As such, there is a significant opportunity for the confectionery industry to launch better-for-you alternatives that are high in protein. This is something that will help alleviate the guilt associated with snacking on confectionery and launching products that appeal to those who have reservations about protein products already on the market.

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Science of Pickling, Explained!



■ By Anusha Mishra, M. Salman Chukkan, Prof. Uday S. Annapure*

The science of food preservation is as old as mankind. This technique emerged in India around four thousand years ago. The first food that is believed to have been pickled is cucumber and was consumed in the Tigris Valley of India. It was widely initiated to preserve the food materials for the people travelling for longer duration in sea voyages South Korea has 'kimchi' prepared from cabbage, radish and other materials. Then Germany has 'sauerkraut' or soured pickled cabbage. The demand for preservation increased in order to overcome improper agricultural planning, to produce value added products and to add variety in diet. In spite of several modern food preservation techniques like chemical additives, hurdle technology, non thermal technologies, pickling of fruits and vegetables continues to have an upper edge. It is an ancestral technique. Pickles are spicy and aromatic food accessory which stimulate the sense of taste and act as appetizers. It is the process of preserving food by anaerobic fermentation in brine to produce lactic acid, or marinating and storing in the acidic solution generally acetic acid. Term pickle is derived from the Dutch word *pekel*, meaning brine. Examples include cauliflower, carrot, radish, garlic, mango etc. It helps in the preservation of perishable foods for longer duration.

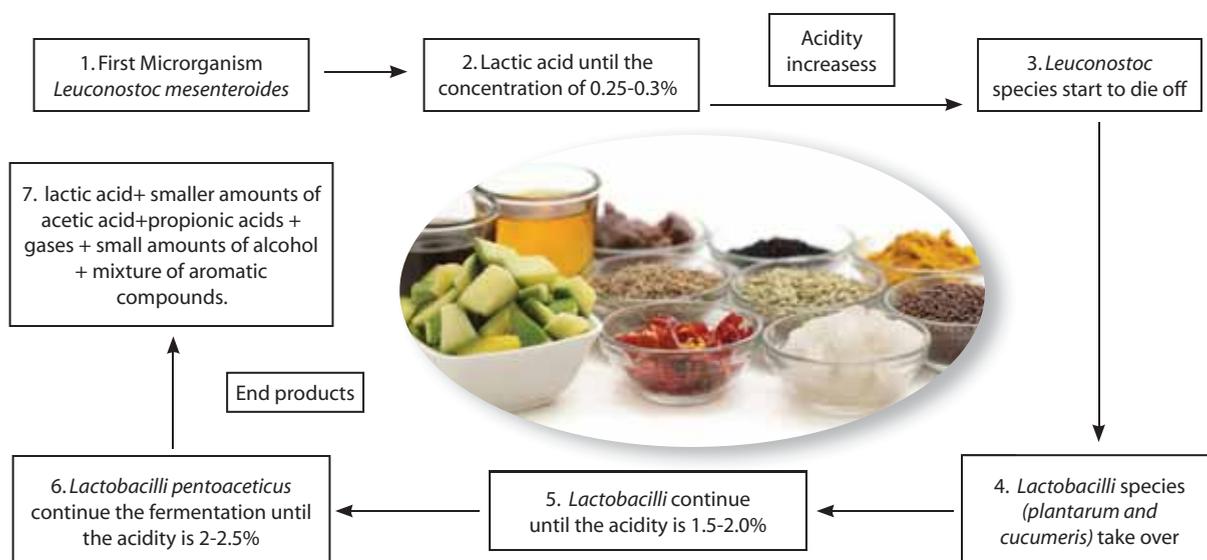
Vegetables such as cucumber, cabbage, olive and onion are fermented by lactic acid bacteria which can grow in low concentrations of salt. The bacteria ferment sugars in the food to form lactic acid, which then prevents the growth of food poisoning bacteria and moulds. The amount of salt controls the type and rate of the fermentation. If 2-5% salt is used, the fermentation

is carried out by bacteria that produce lactic acid. The pickle is preserved by the high level of acidity. If higher levels of salt are used (up to 16%) the product is preserved by the high salt concentration rather than by fermentation and is known as a salt-stock pickle. Fruit and vegetables can be semi-processed and stored for many months by preserving in a high salt solution. In the later season they can be processed into pickle. Sugar is added sometimes to increase the rate of fermentation. Strict attention must be paid to cleanliness and hygiene of fermented pickles as they are not heated in the process. To ensure a good fermentation and preventing the growth of undesirable bacteria, concentration of salt, pH of the mixture and temperature of fermentation must be controlled. Vegetables pickled in acetic acid (vinegar) have salt and sugar added as they are not fermented and therefore have a different texture and flavour.

DIFFERENT PICKLING METHODS

a. Dry salted pickles

Fruits like lemon, lime, mango, cucumber are used for the preparation of dry salt pickle. According to FPO 'pickling in salt,' the sodium chloride concentration should not be less than 15%. The juice is extracted due to the application of dry salt leading to the production of brine. Both microbial population and fermentation are controlled using salt that is measured using a salometer or brine hydrometer. A temperature of 21°C is ideal for lactic acid fermentation; hence the vessel is placed in a warm sunny place to allow fermentation for a week. The absence of bubble production indicates that the fermentation is complete. It takes about one



Product	Salt	Sugar	Vinegar	Process
Fermented Sweet Pickle	5% then 3%	1-2% then 3%	0 then 5%	Ferment for 1-2 weeks then repacked in vinegar + salt + sugar
Fermented sour pickle	5% then 3%	0 then 0	0 then 5%	Ferment for 1-2 weeks
Unfermented pickle	3%	1%	5%	Pack straight away and pasteurise.
Salt-stock pickle	15%	0	0	Store until required. Wash out salt and repack as unfermented pickle

to four weeks to complete fermentation to take place. The quality of fermented vegetables depends on how well the undesirable organisms are controlled during fermentation.

b. Pickling with vinegar

Vinegar serves as a preservative and flavouring agent to pickles. The cut vegetables are immersed in strong vinegar of about 10% strength. This prevents the dilution of vinegar by the water extracted from the vegetable and also expels the gas present in the intercellular spaces. Salt, sugar and spices are added to flavour these pickles. The vinegar concentration in the final product, in terms of acetic acid, should not be less than 2%. Vegetables pickled with vinegar gives a crunchy texture to the product. Cauliflower, onion, garlic, cucumber, celery, carrots and zucchini can be pickled using vinegar. The vegetables are blanched for about 1-2 minutes in a brine solution before transferring to the jar. The jar is cooled to room temperature and the product should be stored in a cool dry place.

c. Pickling with spices

These have a bacteriostatic effect. The essential oil of spices are more inhibitory than the corresponding ground spices. It differs with kind of spice and the micro-organisms being tested. The volatile oil of mustard are very effective against *Saccharomyces cerevisiae*. It seals off the air from the product. It also helps in the better adherence of seasonings to the product. For instance, during mango pickle preparation, mango are first dried to completely remove moisture. Fenugreek seeds, asafoetida, turmeric powder, tamarind, chilli powder, cloves are bacteriostatic. Extracts of the plants are inhibitory to *Bacillus subtilis* and *E. Coli*. Allicin is the active principle in onions and garlic.

d. Pickling with oil

Spice mixtures and /oil are added and the fruit or vegetable is allowed to ferment for a month. The fermentation process renders fruit soft and the fruit takes on the additional aroma and flavour of the spices. Aerobic bacteria and mould growth are prevented by covering the top with oil. Properly prepared and stored pickles can last for a year or more without spoilage. Thus, pickling of fruits and vegetables shall continue to be a promising preservation technique for the times immemorial.

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Recent Advances in Dehydration of **Fruits and Vegetables**

■ By Arshi Siddiqui and Khan Chand*

INTRODUCTION

Drying is the oldest method of food preservation. Fruits and vegetables have essential dietary nutrients such as vitamins, minerals and dietary fibers which are considered important for a balanced diet. These nutrients reduce the risk of possible deficiencies and help to maintain a healthy lifestyle. Fruits and vegetables have a high moisture content of more than 80%. These are classified as highly perishable commodities and are more prone to spoilage. Drying is a suitable alternative to preserve food in a stable and safe condition by reducing water activity, extending the shelf-life much longer than that of fresh produce. Due to the perishable nature of fruits and vegetables, it is necessary to preserve them and drying is one such method for post-

harvest management especially in developing countries like India where cold storage facilities are poorly established. Dried foods are tasty, nutritious, lightweight, easy to prepare, easy to store and use.

Since prehistoric times the preservation of fruits and vegetables is done by the sun and solar drying techniques. But due to the poor quality and product contamination, the alternate drying technologies are developed. The most applicable method of drying includes freeze, vacuum, osmotic, microwave, infrared and hybrid drying.

MODERN DRYING TECHNIQUES

Osmotic drying

Osmosis is known as a partial dehydration process. In this

technique, foods to be dried are placed in a hypertonic solution which causes a difference in concentration and causes the water content of foods to be driven out from the sample to the solution. The change in physical, chemical, nutritional values, taste and structural properties of the final product may be occurred due to the transfer of mass during osmosis. This technique is more advantageous than other conventional methods of drying as it requires less energy to carry out the procedure. Osmotic drying also retains maximum nutrients and has lower product thermal damage as it is conducted at a lower temperature.

Vacuum drying

Vacuum drying technique is used for dehydration of highly perishable commodities. Vacuum

drying technique has a higher rate of drying, lower temperature, and better retention of rehydrating capacity and less energy usage. This technique has good product quality and nutritional value as it has better retention of product colour, taste and other contents such as vitamins and volatile aroma in comparison with conventional drying methods.

Freeze drying

Freeze drying is one of the best methods for drying of fruits and vegetables. It is the process of drying a substance through freezing and removal of solvents associated with direct sublimation. Due to the unavailability of liquid water and very low temperature, the superior quality end product is obtained and also all the deterioration activity and most of the reactions involving the microbes are completely stopped. In the first phase of freeze-drying, about 90% of the water present in the fruits is removed. Freeze-dried fruits



have the ability of rapid rehydration. Also, the organoleptic property of the rehydrated product is almost similar to the fresh product. Freeze drying is advantageous as it has minimum volume reduction, minute chemical change, and minimum loss of volatile components. Freeze-dried products can be stored for a long period too. These are stable and have the ability to be used as antioxidants and colourants. High cost and energy consumption during freezing, drying and condensing process are the

disadvantages of the freeze-dried products.

Microwave drying

Microwave radiation is electromagnetic radiation in the frequency range of 300 MHz to 300 GHz, with 2,450 MHz being the most commonly used frequency. Loss of heat-sensitive components of food can be caused by long drying time and high temperature. Microwave drying is efficient as it requires less time and temperature to remove the moisture content in foods. Microwave drying is more advantageous separately or in combination with other methods of drying such as vacuum drying. Microwave drying is more beneficial than conventional drying due to a short drying period, better quality product and having flexibility in the drying of a wide variety of products.

Infrared drying

Infrared drying is another method for moisture removal from foods having a wavelength range of 0.75 and 1000 μ m. In infrared heating, the charge is built up in the electronic state as well as in the vibrational and rotational state at the atomic and molecular levels. This caused the heating of food without any changes in the temperature of the air surrounding the food. Infrared drying is energy efficient and has minimum drying period, temperature uniformity in the products and high quality of end product.

Hybrid drying/combined drying

Many researchers analyzed that drying techniques which were developed from the combination of two or more drying systems have benefits of both from individual or multistage. Drying systems which are in a combination known as hybrid systems of drying resulted in improved quality of the product.

Hybrid drying system enhances the product quality and reduces the chances of product degradation. The hybrid drying system is more energy-efficient, reduces the duration of the processing, cost-effective and easy to operate.

Combination of the microwave with spouted fluidized bed system of drying improved the drying uniformity and thus reduced the burning. Similarly, non-thermal sources such as ultrasound, ultraviolet and pulse electric field-assisted with convective hot air drying system is an efficient tool in processing. The various studies found a hybrid drying system more feasible and economical.

References

1. Ahmed et al. (2013). Different Drying Methods: Their Applications and Recent Advances. *International Journal of Food Nutrition and Safety*, 4(1):34-42.
2. Hasan et al. (2019). Modern drying techniques in fruits and vegetables to overcome postharvest losses: A review. *Journal of Food Processing and Preservation*, 43(12):1-15.
3. Maisnam et al. (2017). Recent advances in conventional drying of foods. *Journal of Food Technology and Preservation*, 1(1):25-34.
4. Sagar V.R. and Suresh Kumar P. (2010). Recent advances in drying and dehydration of fruits and vegetables: a review. *Journal of Food Science and Technology*, 47(1):15-26.

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THE CHEMISTRY OF FOOD COLOURINGS

■ By Muhammad Salman Chukkan and Anusha Mishra*

Would you drink black water? Clear Pepsi? These are Food fads; it was out of popularity due to Consumer Unacceptance. The major reason for this was that consumer links flavour with certain colours. Food colours are not meant for nutrition, it is added to the food to match the consumer expectations, or to add the colour which is lost during processing, transportation and storage. The link between color and taste is logical. Since oranges are orange, we expect orange-colored barfi to be orange-flavored. Red drinks should taste like pomegranate, and purple drinks should taste like grapes. If food is multi-coloured, the consumers don't usually prefer to have the same, unless you are eating some exotic dishes like blue cheese which gets its distinct flavor from mold! The Demand for colour was increased when the market was introduced with shelf-stable foods or increased shelf-life foods.

According to FSSAI, Food Colour is defined as "A food additive, which adds or restores colour in a food". The food colour can be generally classified as Natural, Natural Identical and Synthetic.

WHY ADD COLOURANTS TO FOODS?

1. Colour is a selection criterion among consumers.
2. For number of food products colour is considered as a quality parameter.
3. To reduce batch to batch variation.
4. To restore the colour lost in processing.

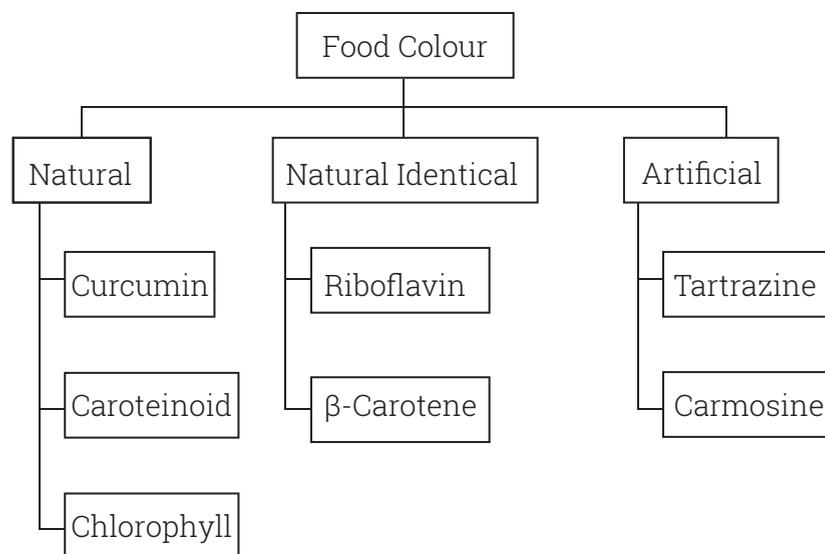
CLASSIFICATION OF FOOD COLOURANTS

a) Natural food colour: It is any dye, pigment or any other substance obtained from vegetable, animal, a

mineral that is capable of colouring foods. Colours come from a variety of sources like seeds, fruits, vegetables, algae and insects. Grass, beetroot, and turmeric are some of the natural sources of colours. The main noticed property among the natural colours is the instability of colours in pH & temperature. This particular property is in contrast to the synthetic and natural identical one. To cop up with this particular situation, technologies involved in plant cell and tissue culture, microbial fermentation and gene manipulation have been applied to that of mass production of stable pigments. These approaches have not yet been approved in terms of human-use.

Some of the products in market with natural colours are Boost, Thumsup, Coca-Cola and Bournvita.

b) Nature (Identical food colourants): Members of this class are actually compounds synthesised to the chemical identity of the natural colourants. Examples include β -carotene, canthaxanthin and riboflavin. Generally, the majority (if not all) of the natural and nature-identical colours are hydrophobic, that is, mostly insoluble in water. This makes the application difficult



in real like usage. One way of introducing them into foods is to convert them into their sodium or potassium salt forms, making them hydrophilic and hence soluble in water. Another approach that is normally used is to dissolve them in a hydrophobic medium such as oil, and then introduce them into water-soluble platforms which can be introduced in foods.

c) Synthetic/ Artificial food colourants: These colours are made out of chemical processes. Examples include carmoisine and tartrazine. They are mainly hydrophilic in nature (water-soluble) which means without pre-processing they can be introduced in the food. Synthetic food colours include azo dyes (amaranth), quinolone (quinoline yellow), xanthene (erythrosine), triarylmethanes and indigoid (indigo carmine). The main classes of synthetic food colours are azo dyes (e.g. amaranth); quinolone (e.g. quinoline yellow); xanthene (e.g. erythrosine); triarylmethanes and indigoid (e.g. indigo carmine). The major disadvantage with the usage of artificial colour is that the consumers are having a chemical-free notion in the selection of foods. Lately, some of the used colours in the last decades were banned by most of the worldwide regulatory bodies. Such as Blue #1 and Blue #2.

The synthetic colours are permitted to be used only in certain foods

S No.	Common Name	Colour
1.	Ponceau 4R Carmosine Erythrosine	Red
2.	Tartrazine, sunset yellow F.C.F	Yellow
3.	Indigo carmine Brilliant Blue F.C.F	Blue
4.	Fast green F.C.F	Green

S.No.	Colour	Derivative
1.	Anthocyanins	Glycosidic derivatives of the 2-phenylbenzophrylium structure
2.	Carotenoids	Aliphatic and alicyclic unsaturated terpenes composed of eight isoprene units
3.	Xanthophylls	Closely related to carotenes but have keto / hydroxyl substituents
4.	Betalines	Quaternary ammonium derivatives of 4-vinyl-5, 6- dihydropyridine-2, 6-dicarboxylic acid
5.	Caramel	Heating a food grade carbohydrate like glucose, sucrose or starch in the presence of catalyst acetic sulphurous or citric acid or bases such as ammonium, calcium and sodium hydroxides.

Sources of natural food colours

S.No.	Food Colourant	Colour	Source
1.	Anthocyanin	Red to Blue	Mature Fruits (Strawberry, Blueberries etc), Vegetables (Onions, Cabbages).
2.	Betalins	Red	Beetroots
3.	Caramel	Brown to dark brown	Catalytic heating of carbohydrates
4.	Carmic Acid or	Red	Female Cochineal Insects
5.	Lycopene	Deep-Red	Tomato
6.	Chlorophyll	Green	Green leaves
7.	Curcumin	Yellow	Turmeric



with a declaration on the label. The maximum quantity permitted is 200 mg/kg. Some of the foods in which food colour is permitted are ice – cream, biscuits, cakes, sugar, boiled confectionery, sweets and savouries, fruit syrup, fruit squash, fruit drink, soft drink, jam, carbonated water, ready to serve beverages and synthetic syrup. Congo Red, Malachite green, orange Red, Sudan III and lead chromate are harmful hence prohibited to

be used in food preparations. The pink dye Rhodamine B, Orange RN II and Blue VRS are carcinogenic and cause disruption of various organs like kidney, spleen and liver. Metanil yellow causes degeneration of reproductive organs. Hence, it is essential for consumers to be aware of these colours and properly read the label before buying the foodstuff.

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PROCESSING OF PASTEURIZED MILK

■ By Sabbu Sangeeta & Sweta Rai*

INTRODUCTION

The pasteurized or market milk refers to fluid whole milk that is sold to individuals usually for direct consumption.

CONSTITUENTS OF MILK

i. Major constituents: It includes water, fat, protein, lactose and ash/mineral matters.

ii. Minor constituents: it includes phospholipids, sterols, vitamins, enzyme and pigments etc.

iii. True constituents: it includes milk fat, casein and lactose.

PROCESSING OF PASTEURIZED MILK

A. Buying and collection of milk

- Various methods for buying milk are employed, singly or

in combination and payment based on weight or volume, the fat content of milk, use, quality (flavour, colour, sediment test, bacterial count etc) and cost of production of milk.

- In almost all countries, the production of milk is confined to rural areas, while demand is mostly urban in nature. Hence milk has to be collected and transported from the production area to processing and distribution point. Milk can be collected from a different co-operative organization, through contractors and by individual producers.

B. Cooling and transportation of milk

- Milk should be cooled to below 5°C at farm or at chilling centre because common milk micro-

organisms grow best between 20 to 40°C, so prompt cooling is required and it is essential for safe transportation. Different methods can be employed for cooling of milk such as can-immersion method, surface cooler and bulk-tank cooler etc.

- Milk should be transported from chilling centre to processing unit in morning or in evening hours. Mode of transport depends upon the carrying load, the distance of collection and local conditions. Refrigerated vehicles should be used to prevent the increase in acidity and microbial content of milk.

C. Receiving of milk

When milk is received at the milk plant/dairy, it should be free from off-flavours and extraneous matter.

Milk should be at 5°C or below with clean, sweet and pleasant flavour. Several procedures are following at receiving plate-form as enlisted below:

i. Unloading: The milk cans are unloaded manually.

ii. Grading: The principle of grading is based on different platform test such as organoleptic tests (odour, taste, appearance and touch), acidity, sediment, lactometer reading etc.

iii. Sampling: It is done for chemical and microbial test of milk. Samples may be individual, composite (mixture of two or more individual lots of milk), drip (representing the entire day's supply) etc.

iv. Weighing: This is the essential step in accounting for milk receipts and disposal, making payments for milk, etc. The milk-in-cans is dumped into the weigh tank, either manually or mechanically. The milk can be measured by weight or by volume.

v. Testing: Apart from initially accepted/rejected lots of milk, there is always some of doubtful quality. All the accepted lots have already been properly sampled; these, together with samples of the remaining two categories, have to be tested in the quality control laboratory for the final verdict of acceptance/rejection. Further, a record of the chemical and bacteriological quality of all accepted milk has to be maintained for making payments, etc.

D. Pre-heating

- The milk is pre-heating for efficient filtration/clarification. As the temperature of the milk increases, the viscosity decreases and more efficient filtration/clarification results. The usual temperature of pre-heating is 35-40°C.

BOTTLES FILLED WITH RAW MILK AND TIGHTLY SEALED WITH SPECIAL CAPS ARE HELD AT 63-66 °C FOR 30 MINUTES. HEATING IS DONE INDIRECTLY THROUGH A METAL WALL INTO THE PRODUCT. THE PASTEURIZER MAY BE OF DIFFERENT TYPES LIKE WATER-JACKETED VAT, WATER-SPRAY TYPE AND COIL-VAT TYPE USED IN THIS METHOD.

E. Filtration/clarification

- It is done to improve the aesthetic quality of milk by removing visible foreign matter. In filtration remove the suspended matter by straining process while in clarification remove the same by centrifugal sedimentation.

F. Cooling and storage of raw milk

- As soon as milk is received in the plant, it is chilled to 5°C or below and stored cool till used, to prevent deterioration in its bacteriological quality during the interim period. Different methods such as plate cooler, surface cooler, internal tubular cooler, jacketed vat tanks can be employed for cooling purpose.
- Modern milk plants hold both raw and pasteurized milk for a much longer period. Normally the milk storage capacity is equal to one day's intake. This allows a more nearly uniform work-day for processing and bottling operation with less dependence on time for receiving raw milk.

G. Standardization

- It refers to the adjustment of fat and/or solid-not-fat (SNF) percentage of milk to a desired value according to legal standards.
- Different milk which is available in market has different fat and SNF

ratio such as 3% fat and 8.5% SNF of toned milk etc.

H. Pasteurization

It is the process of heating below 100 °C to improve the quality of milk by destruction of almost all spoilage organisms followed by prompt cooling to 5°C. Pasteurization of milk was first attributed by Dr. Soxhlet of Germany in 1886. Different methods are used for pasteurizing the milk as described below. Index micro-organism of milk pasteurization is *Coxiella burnetii* and index enzyme is alkaline phosphatase.

a) In-bottle-pasteurization: Bottles filled with raw milk and tightly sealed with special caps are held at 63-66 °C for 30 minutes. Then the bottles pass through water sprays of decreasing temperatures which cool both the product and the bottle. This method prevents the possibility of post-pasteurization contamination. This method has some loophole such as slow method, greater risk of bottle breakage, required high-quality water tight caps etc.

b) Batch/Holding pasteurization/ Low-Temperature-Long-Time (LTLT): The milk is heated to 63°C for 30 min and promptly cooled to 5 °C or below. Heating is done indirectly through a metal wall into the product. The pasteurizer may be of different types like water-jacketed vat, water-spray type and coil-vat type used in this method. This method is rather slow and involves too much agitation, causing churning and impairment of creaming properties.

c) High-Temperature-Short-Time Pasteurization (HTST)/ Flash Pasteurization: This method was first introduced by A.P.V.Co. in the United Kingdom in 1922. It gives the continuous flow of milk which is heated to 72 °C for 15 seconds and promptly cooled to 5 °C or below.

partially and indirectly cooled by the incoming cold milk (milk-to-milk regeneration). This again adds to the economy of the HTST process.

x. Hot Water Set: Circulates hot water through the heating section of the machine to maintain the correct milk temperature within very fine limits.

xi. Automatic Control Devices: These includes steam pressure controller, milk temperature recorder etc. to ensure proper pasteurization.

xii. Pressure in the System: The normal pressures maintained in the system are:

- Pasteurized milk - 15 psi
- Raw milk - 14 psi
- Heating/cooling medium - 12-13 psi

xiii. Holding test time: Several methods are used for determination

of the holding time such as electrical conductivity method, dye injection method, electronic timer method etc.

d) Electric Pasteurization

e) Vacuum Pasteurization: Milk is pasteurized under reduced pressure by direct steam. This process is also called 'Vacreation'.

f) Stassanization: In this method, pasteurization is carried out in a tubular heat exchanger. Milk is heated to the desired temperature by passing it between two water heated pipes through narrow space of 0.6-0.8 mm. The milk is heated to about 74 °C for 7 seconds and immediately cooled.

g) Ultra-High-Temperature pasteurization: The milk is heated to about 135-150 °C for a fraction of second (no-hold). This method

required immediate aseptic packaging.

h) Uperization/ Ultra-pasteurization:

In this method milk is heated with direct steam up to 150 °C for a fraction of second.

I. Bottling / Packaging: The pasteurized and cooled milk is immediately bottled /packaged to protect the milk against contamination, loss, damage or degradation due to micro-organisms, exposure to heat, light, moisture and oxygen etc.

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Powder Processing Solutions for Plant-based Protein in Research & Development



Figure 1: IMPROVE Protein center at Amiens

■ By Markus Eggenmüller*

The increasing demand for plant-based protein in the last years activated research and industry to find reliable food solutions for the market. Plant proteins have a lower impact on the environment than meat and the industry focusses on protein from cereals, pulses, algae or mushrooms.

Located one hour north of Paris in Amiens, the R&D center IMPROVE supports over 300 food processors worldwide in creating new food solutions to meet consumers' needs and expectations. In the protein sector, IMPROVE shows expertise in dry processing, wet processing and product characterization regarding composition, invitro digestibility, particle characterization and functional properties. Its product processing portfolio shows a diversified range of raw materials like cereals, pulses, oilseeds, co-products from the food or feed industry, algae, insects and microorganisms. Looking for sustainable production for protein-enriched plant flours, IMPROVE identified dry fractionation to have a huge development potential to produce protein-rich food ingredients (Figure 1).

Multiprocessing System for testing the whole chain of protein enrichment

"IMPROVE is working on a wide range of material for food and feed applications. Our requirement was to get versatile material compatible with food practices", Mr. Denis Chereau, CEO of IMPROVE, explained. For this reason, he decided to go for the protein shifting process of Hosokawa Alpine that combines the finest milling and high-end air classification to enrich flours from pulses e.g. faba beans, peas or lentils.

His first choice was Hosokawa Alpine, a world market leader in powder processing and key equipment

supplier for dry processing, based in Augsburg, Germany with its Multiprocessing System (Figure 2).

It allows research in the complete production process from dehulling the raw seeds, fine milling and finest grinding up to precise air classification of the flour. A ZigZag classifier combined with a Multiprocessing System consisting of a fluidized bed opposed jet mill, a classifier mill, a fine impact mill and an ultrafine high-tech classifier is the veritable allrounder in protein shifting for research and development.



Figure 2: Alpine Multiprocessing System



Figure 3: Alpine pin mill UPZ (right) for small-scale testing

First, the pre-cracked pulses are dehulled at the ZigZag classifier by simple air separation. Then, the dehulled pulses are ground to fine flour e.g. with the fine impact mill UPZ. The key difficulty of dry protein enrichment must be solved in the next two steps: the protein-starch agglomerates in the pulse flour must be separated by impact milling technology without destroying the starch particles. This is possible with the classifier mill ZPS or, for an even more fine top cut, with the air jet mill AFG. With the high-end air classifier ATP, the flour is separated in a fine, protein-rich fraction and a coarse starch-rich fraction. For several products, protein contents up to 65% with 30% yield can be reached without wasting water and consuming less energy.

The small-scale machines can be installed and changed quickly at the system corpus. A wide range of machine equipment e.g. different pin discs, plate beaters, nozzles and classifier wheels make it easy to try different adjustments to find the right processing solution. Because all machines are engineered, machined and assembled by Hosokawa Alpine itself, the Multiprocessing System gives a good indication for later production. For a production scale-up, the test center of Hosokawa Alpine in Augsburg gives the possibility to run tests on bigger machine sizes up to several hundred kgs/h of material throughputs at 3000 sqm (Figure 3).

Figure 4: Multiprocessing plant at IMPROVE



Connect science and industry for future protein supply Looking into the future, the protein supply will be a challenge that must be solved from both the industry and research. For this reason, collaborations are getting more and more important to interlock science and process engineering. "Hosokawa Alpine is a very professional organization and we are sure that in future IMPROVE & Hosokawa Alpine will continue to work closely in order to well serve our customers and to develop new processes," Mr. Chereau said. The Multiprocessing System is the matching instrument to find the best sustainable food solution for processors of plant-based protein ingredients (Figure 4).

* Author is Senior Manager New Business Development - Key Accounts Food Division Hosokawa Alpine AG, Augsburg, Germany

New Digital Sorters for Gummy Candies Introduced

Key Technology, a member of the Duravant family of operating companies, introduces VERYX® digital sorters for gummy candies. Designed specifically to detect and remove foreign material (FM) and gummies with bits of remaining starch as well as color and shape defects, VERYX enables gummy candy manufacturers to improve product quality and protect their brand while virtually eliminating false rejects to maximize profitability.

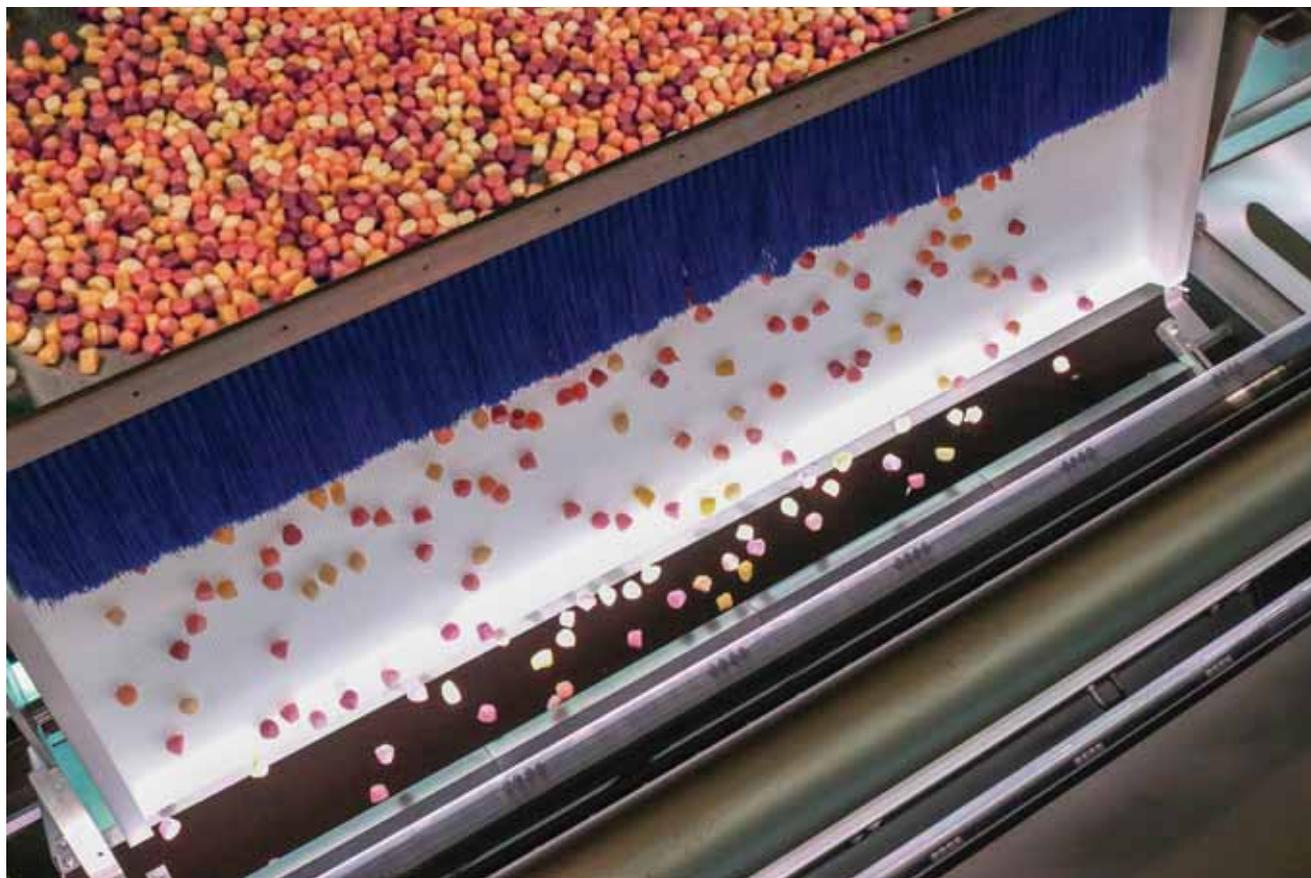
"VERYX's unique sensor configuration not only allows for the most

thorough all-sided surface inspection but also offers patented Pixel Fusion® for advanced detection," said Karel Van Velthoven, Advanced Inspection Systems Product Marketing Manager at Key. "Our gummy candy customers with installed VERYX systems are experiencing a sorting accuracy that was unseen until now."

VERYX sorts oil-coated, sugar-coated, yoghurt-coated and vitamin-enhanced gummy candies. It detects color, size, shape and structural properties to find gummies with bits of remaining starch, even when inspecting milky-white, yogurt-

coated candies that are the same color as starch and have a similar texture. It detects all types of FM, including plastic and wood, to give candy manufacturers using plastic or wood trays in their candy-making process assurance that fragments of a broken tray don't get packaged with the product. The sorter also detects color defects such as mixed color gummies and shape defects such as clumps, conjoined gummies, malformed gummies, mold spills and more.

Key optimizes VERYX with the ideal cameras, laser sensors,



algorithms and ejection system for gummy candies. Additionally, an application-specific line layout with an optional defect resort system blends Key's expertise in digital sorting and mechanical product handling, further contributing to new standards of performance for gummy candy sorting. This integrated solution combines a chute-fed VERYX sorter with specialized Iso-Flo® and Impulse® vibratory shakers to achieve superior FM/defect removal rates with virtually no false rejects.

Equipped with front- and rear-mounted cameras, laser scanners and multi-sensor Pixel Fusion™ detection modules, VERYX views all sides of the product with no blind spots to find and remove more FM and defects. The next-generation 4-channel cameras and high-resolution laser sensors offer twice the resolution of previous sensor technology to see smaller FM and defects, including gummies with bits of remaining starch as small as one square millimeter. Key's unique Pixel Fusion technology combines pixel-level input from multiple cameras and laser sensors to produce higher contrasts, enabling VERYX to find and remove the most difficult-to-detect FM and defects.

Object-based sorting facilitates advanced shape sorting algorithms and intelligent ejection on VERYX.

**PRODUCT
CHANGEOVERS ON
VERYX ARE FAST AND
EASY. WITH DOUBLE-
SIDED PIXEL FUSION,
THE DETECTION SYSTEM
IS SO ADVANCED, EVERY
TYPE OF GUMMY CANDY
CAN BE ACCURATELY
SORTED USING THE
SAME BACKGROUND SO
HARDWARE CHANGES
ARE ELIMINATED.**

While most gummy candy manufacturers will program their sorter to remove shape defects such as clumps and conjoined gummies, other minor misshaped gummies might actually delight young consumers and may be programmed as acceptable on the sorter. Intelligent ejection improves the accuracy of all FM/defect removal and reduces false rejects. Rather than firing an ejector at the defect itself, VERYX performs contour-based and/or centroid-based calculations to target ejectors at the object's center of mass to ensure FM/defect removal while maximizing yield.

Product changeovers on VERYX are fast and easy. With double-sided Pixel Fusion, the detection system is so advanced, every type of gummy

candy can be accurately sorted using the same background so hardware changes are eliminated. VERYX's unique recipe-based sorting takes away the hassle of configuring the sorter for each new type of candy. Changing over to a new gummy shape or color takes only a couple of taps on the touchscreen to load the dedicated recipe. This recipe-driven operation simplifies use and ensures repeatable results so product quality is guaranteed, regardless of personnel changes and across multiple lines and locations.

VERYX can also leverage Key's powerful Information Analytics software, which allows users to analyze and share big data across their enterprise via an OPCUA-compliant infrastructure at the same time they sort. Data about the sort process and about each and every object flowing through the sorter, whether the data is used to make sort decisions or not, is available to reveal patterns, trends and associations. This data can help a processor optimize processes upstream and downstream of the sorter to achieve the next level in operational efficiency.

VERYX is available in multiple sizes to satisfy a range of capacity requirements, with the highest volume system sorting up to five metric tons of gummy candies per hour.

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Messe Düsseldorf, the organizers of Interpack 2020 – a leading trade fair for the Processing and Packaging Industry, arranged media and industry interaction in Delhi on 12th December 2019. On the panel were Mr. Bernd Jablonowski, Global Portfolio Director - Processing & Packaging, Messe Düsseldorf GmbH, Mr. Arvind Goenka, Vice Chairman, The Plastics Export Promotion Council and Mr. Thomas Schlitt - Managing Director, Messe Düsseldorf India Pvt Ltd., who interacted and updated the Industry on the latest developments at Interpack 2020, market trends and industry insights.

The interpack2020 trade fair is totally booked out. By the time the official registration deadline for the most important international event for the packaging industry and related process industries had arrived, businesses had inquired about far more space than was available at the Düsseldorf Exhibition Centre – as had already been the case with the previous editions. The around 3,000 exhibitors expected from approximately 60 countries will therefore again be occupying all 18 of the available halls as well as large parts of the outdoor facilities when the fair takes place from 7 to 13 May 2020. 'components – special trade fair by interpack' with offerings from

the industry that supplies packaging technologies, is in its third edition and will again be staged entirely concurrently with interpack in the temporary Hall 18, is also totally booked out. One ticket entitles holders to admission to both fairs.

MORE EFFICIENT TRADE FAIR VISIT

Interpack focuses on packaging solutions and related process technology, addresses target groups in the fields of food, drinks, confectionery, bakery products, pharmaceuticals, cosmetics, non-food consumer goods and industrial goods. Exhibitors have now also been brought together to create more focused segments with corresponding offerings in order to prevent visitors from these industries from having to cover long distances. That is why suppliers of processes and machines for the packaging of pharmaceuticals and cosmetics have gathered together in Halls 15 to 17 while interpack 2020 visitors from the fields of machines for labelling and identification technology, packaging-materials production and integrated packaging printing will find what they are looking for in Halls 8a and 8b.

The offerings in these halls have also been more clearly structured so that it will be easier for visitors to find the exhibitors that are of interest to them here.

'COMPONENTS' TO RUN ENTIRELY CONCURRENTLY WITH INTERPACK

The concept of 'components – special trade fair by interpack' is to be continued in its tried-and-tested iteration following the success it enjoyed at the last interpack. Visitors will once again find the supplier trade fair in the temporary lightweight Hall 18, which is centrally located within the Düsseldorf exhibition

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CENTRE AND OFFERS
AROUND 5,000 SQUARE
METRES OF SPACE.**

centre and offers around 5,000 square metres of space. This hall is located between Halls 10 and 16 and will be complementing interpack's portfolio for the entire duration of the trade fair with presentations from the areas of drive, control and sensor technologies, products for industrial image processing, handling technologies and other (machine) components. All visitors and exhibitors at interpack are entitled to free admission to components.

NEW IMPETUS FOR SAVE FOOD

During interpack, the topic of SAVE FOOD is going to be brought to the city of Düsseldorf for the first time in with several different campaigns to reduce food losses and waste and will accordingly get the public directly involved. The programme details are currently still being developed in consultation with the official bodies.

'LIFE WITHOUT PACKAGING?' CONFERENCE

Sustainability has been a subject that has been shaping the industry for years and that has recently become a hotly debated issue as a result of the discussion about plastic packaging in particular. The new 'Life without Packaging?' conference will be examining the contentious issue of packaging, sustainability and the environment from various aspects to enable both critics and advocates to have their say and explore what is essential and what is avoidable. The event will be focusing on sustainability and environmental impact, hygiene and the reduction of food waste. The top-class speakers include such representatives from the industry as Prof. Dr. Thomas Müller-Kirschbaum, Head of R&D and Sustainability at Henkel; Louis Lindenberg, Global Packaging Sustainability Director at Unilever; and Xavier Caro, Head of Packaging for the Food Category, Nestlé; as well as Alexander Baumgartner, CEO at Constantia Flexibles. Dr. Marina Beermann from the WWF as well as representatives from environmental organisations will further be joining the line-up of speakers. Prominent voices from science along with sustainability consultants will also be joining the bill: Prof. Dr. Martin Stuchtey, Founder of and Managing Partner at Systemiq, Frank Wellenreither from the ifeu Institute and Sophie Kesselbach from Thinkstep will be introducing their analyses and solutions.



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Bigger, stronger, faster: new igus linear robots for cost- effective automation in Food Industry



Picture PM6419-1
Bigger, stronger,
faster: the new igus
lubrication-free room
linear robot moves
heavy loads across
large workspaces.
Loads of up to 50 N
can be transported
in a workspace
of 800x800x500
millimetres at a
maximum speed of
0.5 m/s. (Source: igus
GmbH)

Low cost process automation with lubrication-free drylin linear robots from igus

Simple, precise, fast processes: these are the requirements of Cartesian robots. They are used for such things as pick-and-place applications, sorting systems. igus has now developed a linear and room linear robot for large workspaces. The two new kinematics systems allow users to move up to five kilogrammes. Both linear robots are available directly from stock. They can also be customised to suit the customer application in question – no minimum order quantity.

To survive on the market, both large industrial players and small companies need automated solutions that will quickly pay for themselves. For years, Cartesian robots have been a means of choice in automation technology. They allow users to complete their tasks quickly, easily and cost-effectively. All that is required is a little bit of programming effort. igus' lubrication-free linear axes developed in several stages are available from as little as €1,800. Depending on the application's requirements, two-axis linear or flat linear robots and three-axis room linear robots can be selected. At Motek, igus introduced a new line robot and a new room linear robot with an enlarged workspace, which allows users to move even greater loads across an even larger area.

Low Cost Automation with lubrication-free linear robot solutions

The two linear robots consist of pre-configured linear modules, aluminium linear axes, NEMA stepper motors and encoders. The new line robot can transport loads of up to 50 N in a workspace of 800x500mm at a maximum speed of up to 1 m/s. "The investment risk of €2,100 for the line robot is manageable, so that our automated pick-and-place applications for assembly tasks pay for themselves in less than six months. This means that decision makers have a low level of risk", says Alexander Mühlens, Head of Automation Technology at igus. The new room linear robot is a good option for more complex tasks. It can transport loads of up to 50 N in a workspace of 800x800x500mm at a maximum speed of 0.5 m/s. Two ZLW toothed belt axes and one GRR gear rack axis ensure precise guidance and lubrication-free operation.

For fully automated sorting tasks

The new linear robot solutions are used in pick and place, bin picking and sorting tasks. Most of these processes have

been moved to the end of the production line. This was also true at FachPack 2019 in the showcase of SSI Schäfer, the intralogistics specialist. The new drylin room linear robot automated the provision of sensitive products using a transport box with a thermoform insert. The specially developed packaging and the use of a linear robot allowed various coloured handles to be pre-sorted for the production of a household appliance. There are other linear robot use scenarios in microelectronics and automated testing.

Customise room linear robot design

In addition to the stock items, users can assemble their own linear robot with strokes of up to six metres at <http://www.igus.eu/robot-enquiry> and request a quotation from igus. Depending on customer requirements, axis length and various motors can also be configured with such items as energy chains and cables from igus.

ABOUT IGUS

igus GmbH is a globally leading manufacturer of energy chain systems and polymer plain bearings. The Cologne-based family business has offices in 35 countries and employs 4,150 people around the world. In 2018, igus generated a turnover of 748 million euros with motion plastics, plastic components for moving applications. igus operates the largest test laboratories and factories in its sector to offer customers quick turnaround times on innovative products and solutions tailored to their needs.

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Food fortification or enrichment is the process of adding micronutrients (essential trace elements and vitamins) to food. It may be a purely commercial choice to provide extra nutrients in a food, while other times it is a public health policy which aims to reduce the number of people with dietary deficiencies within a population. Young children are particularly vulnerable to nutrient deficiencies. Without added vitamins and minerals, many children and teens don't meet daily nutrient requirements. Fortified and enriched foods are important sources of nutrients for kids, especially for iron, zinc, and B vitamins.



Foods for children are fortified with iron, a practice which has substantially reduced the risk of iron-deficiency anemia in this age group.

Toshniwal mixer in rice fortification offers "Twin shaft" paddle mixer of Norwegian technology, high precision mixing equipment to prove absolute choice in iron fortification for rice. The mixing equipment is an ideal choice for the non-government organization in India and abroad who intent to execute the Iron fortification rice plant.

The special advantage of Toshniwal mixer

- Homogeneous mix in shortest possible time
- Gentle mixing
- Precision in mixing
- Dust free transfer
- Lower maintainance and easily cleaned

Fortification advantages

- If consumed on a regular and frequent basis, fortified foods will maintain body stores of nutrients more efficiently.
- Fortification generally aims to supply micro nutrients

in amounts that approximate to those provided by a good, well-balanced diet.

- Fortification of widely distributed and widely consumed food has the potential.
- To improve the nutritional status of a population for both poor and wealthy fortification requires neither changes in existing food patterns nor individual compliance.
- When properly regulated, fortification carries a minimal risk of chronic toxicity.

Toshniwal specializes in design ,engineering and manufacturing powder processing equipments which can be used for mixing, transferring of powder,granules/ pellets and retrofitting of ribbon blender.

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Individual and Ecological: New Wide-Neck PET Containers for Hot Filling Developed

- PET alternative to non-returnable glass considerably reduces the carbon footprint
- Manufacture on the energy-efficient KHS InnoPET Blomax Series V possible
- Individual container systems with optimum product protection

Safe, customizable and ecologically favorable: for the very first time at the K-Show KHS presented wide-neck PET containers that are suitable for the hot filling of food. With its low weight and good recycling properties, this line-compatible container reduces the carbon footprint throughout its entire life cycle. This alternative to the non-returnable glass receptacle also provides a high level of product safety thanks to FreshSafe PET® coating.

“Saving carbon dioxide is an important issue for food companies, both regarding the design of the packaging and the way their supply chains are organized,” says Sebastian Wenderdel, non-beverage global product account manager at KHS Corpoplast in Hamburg, Germany. With its innovative systems, the turnkey supplier from Dortmund assists its customers in this endeavor throughout the entire value

chain. “It’s our aim to not only reduce our customers’ carbon footprint but also increase production reliability. Individually designed, lightweight containers also improve the consumer experience,” he reports.

SUSTAINABLE ALTERNATIVE TO NONRETURNABLE GLASS: WIDE-NECK PET CONTAINERS FROM KHS

The best example of the above are the new, hot-fillable, wide-neck PET

containers for food from the system’s supplier – an unbreakable, resource-saving and highly customizable alternative to the traditional non-returnable glass container. This line compatible type of packaging can be produced on the energy-efficient InnoPET Blomax Series V stretch blow molder in what is known as the blow-trim process or from preforms with a molded neck which can be crystalline as required. “By heating the blow molds electrically we can thermally condition the containers for standard market filling temperatures,” Wenderdel explains. The PET alternative has been designed to withstand both the positive and negative pressures which can occur in the closed container following the filling process.

SAFE AND ECOLOGICALLY FAVORABLE: PET CONTAINERS HAVE MANY BENEFITS

KHS has consciously opted for PET plastic for its new wide-neck containers. “At the moment most wide-neck containers are still made of non-returnable glass. PET containers have many advantages over glass, however, and not just as far as costs are concerned,” Wenderdel tells us. The plastic packaging is primarily worth considering from an ecological standpoint alone. “PET preforms aren’t just much lighter than glass containers; they’re also

Wide-neck containers: With its low weight and good recycling properties KHS’ line-compatible container reduces the carbon footprint throughout its entire life cycle.



smaller, which means that they take up less space during transportation and storage," he smiles. Even when full the plastic container has a clear ecological advantage over glass en route to the consumer thanks to its low weight.

PET containers also have a higher energy efficiency than non-returnable glass receptacles. During both in-house manufacture and recycling, they consume considerably less energy and thus ecologically harmful CO₂. Wenderdel explains that "PET is a good insulator. The filling temperatures needed to obtain the necessary number of pasteurization units are thus lower than those for glass." All of these benefits help beverage bottlers to cut their carbon emissions by up to 90%

– especially if they use containers with high recycle content.

KHS ENABLES CUSTOMIZED CONTAINER SYSTEMS

Another advantage of PET containers is their great capacity for individual design. This aspect is particularly important when it comes to hot filling. "It's not possible to implement a generic container system here as there are large variances from customer to customer in the process steps, i.e. in the preparation, filling and handling of containers," says Christian Rommel, head of Packaging Design at KHS Corpoplast.

With its holistic Bottles & Shapes™ consultancy program KHS provides the perfect answer to this specific

challenge. The German engineering company supports bottlers throughout the entire design process, at the end of which a customized container is produced which is perfectly tailored to the customer's individual requirements and takes the specifications of the filling line into direct consideration.

For products that are extremely sensitive to oxygen, the wide-neck container can be given a tried-and-tested FreshSafe PET® coating. Thanks to the thin layer of glass applied to the inside of the bottle, this barrier coating provides optimum product protection. This type of container combines all the advantages of light, fully recyclable plastic packaging with those of a gas-tight glass container.



Cast-Coextrusion IWS film

Specialized in cast-coextrusion with the development of a film for hot fill sliced processed cheese. This innerwrap film offers excellent sealing and easy opening properties, an excellent "cheese release" as well as a perfect barrier ensuring the perfect preservation of the product and its flavor.



Aluminium foil lacquering

The 10 to 20 my aluminium foil, printed or unprinted, is lacquered both sides and is used for the very particular field of processed cheese portions packaging.



EURO-M

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Peel-off Made Easy – in Any Case

- Among thermal adhesive bonds, the new 42Rpp adhesive, which replaces the 42R, ensures an easy peel-off—without impairing the thermal reaction.
- The 42Lpp peel-off adhesive on the other hand delivers best results on particularly critical surfaces such as glass, metal and plastic.
- If necessary, the 42X adhesive provides an easy peel-off even on unusual label materials without leaving any residue – thus allowing for maximum flexibility.

Peel-off label adhesives have so far often had system-related weaknesses – for example when dealing with thermal papers or luxurious or critical surfaces. To change this, HERMA aims to use its innovative multi-layer technology. With the new 42Rpp peel-off adhesive, for example, the penetration of the adhesive through thermal paper that can make printed barcodes illegible over time and has been the bane of the industry is now a thing of the past: tests show that even after five months and at temperatures of up to 40 °C the good legibility of the label imprint remains unchanged. This is important, since such labels are frequently used on reusable containers in intralogistics. Their durable legibility is a prerequisite for safe processes. Glue residue left behind after pulling the label off the surface – the so-called “staining” – is no longer a problem.

This allows users to apply thermal labels even to high-quality, fancy packaging without fear of unsightly residue being left behind. HERMA was also able to noticeably minimise the tightening of the adhesive after labelling, i.e. the reduction of strippability over time due to technical reasons. This is thanks to the multi-layer technology developed by HERMA in which two adhesive layers with their own special properties are applied at the same time.

UNIVERSALLY USABLE WITHOUT “GHOSTING”

The multi-layer technology is not only useful for thermal labels: the new 42Lpp peel-off adhesive has shown an impressive performance on numerous different surfaces and ensures a particularly good strippability from glass, metal and plastic. It is quite resistant to

softening agents, and even after being subjected to temperatures of up to 65 °C, its peel-off properties remain guaranteed. This property is particularly valuable for users in the glass industry. The so-called “ghosting” – a piece of residue on a surface that had a label on it that may not be sticky, but is still clearly visible and filmy – is no longer a problem with the 42Lpp thanks to HERMA's multi-layer technology.

SMALL MINIMUM COATING QUANTITIES

With the new UV acrylate-based HERMA 42X peel-off adhesive, HERMA offers printers and label users an additional valuable advantage: thanks to small minimum coating quantities starting at 1,000 square metres, peel-off versions can even be made for special label materials. Even partial gumming can be realised with this adhesive. For example, resealable tabs can be easily realised. Customers thus have a high degree of flexibility in choosing their label materials, allowing them to quickly test under

practical conditions if a specific combination of adhesive and label material is suitable for the desired application. In principle, the 42X ensures good adhesion as well as strippability on a multitude of substrates. At the same time, it offers optimum resistance against water, cleaning products and oils and shows no increased stickiness over time – this means that strippability remains guaranteed over longer periods.

The 42Lpp peel-off label-adhesive leaves no residue. Even after being subjected to temperatures up to 65 °C, it does not exhibit increased stickiness. This makes it ideally suitable for use in the glass industry.





Sappi's new Algro Design portfolio offers ample scope to communicate brand values and product characteristics in an emotional way.

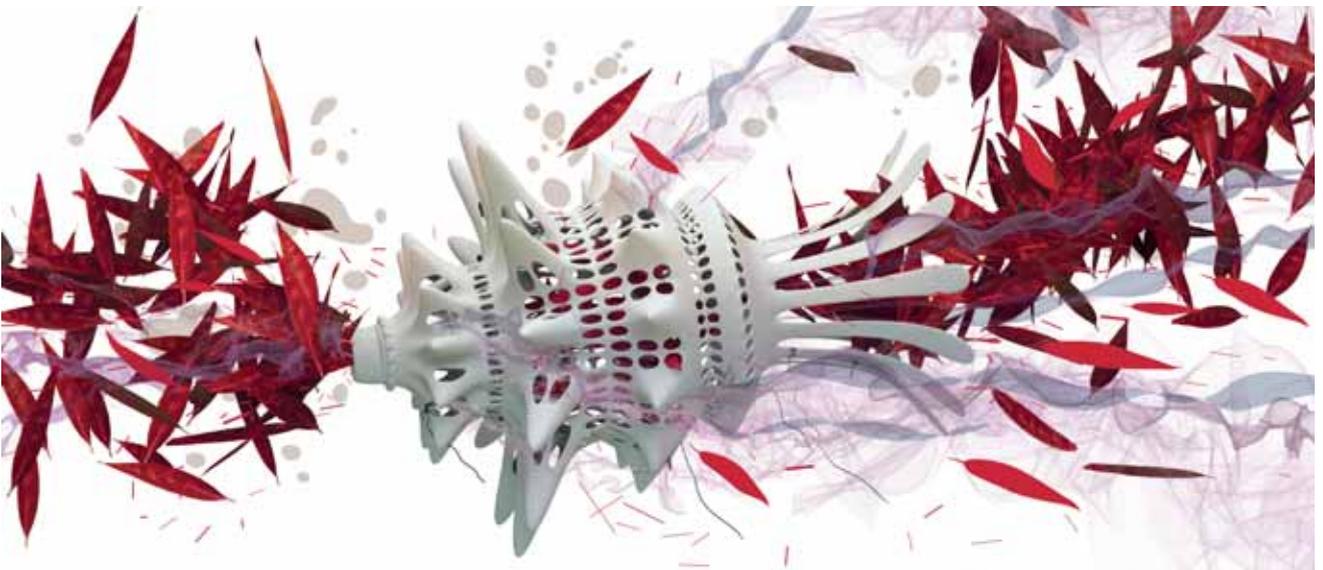
More Emotionality and Greater Differentiation

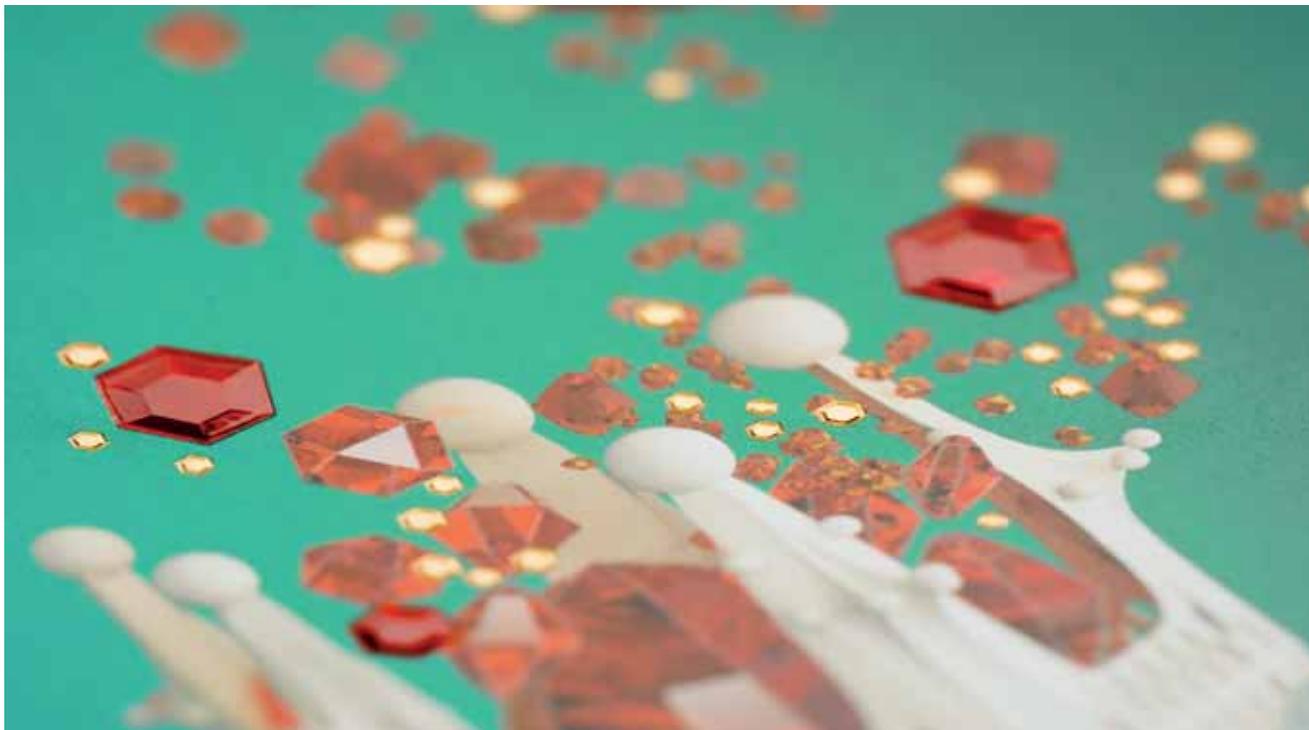
Maximum design freedom with the new Algro Design portfolio from Sappi

Communicating brand values and product characteristics in an emotional way and staging them in an appropriate manner is becoming increasingly important for brand manufacturers. To connect with the end consumer, they need to have paperboards that enhance the visual and tactile experience. In response to these needs, Sappi is now introducing the next generation of its popular and proven Algro Design portfolio – with an enhanced paperboard version and a change of name.

More and more consumers want exclusive, customized packaging that reflects a brand's unique selling points and special character. For even more flexibility and design scope, Sappi is expanding its range of premium solid bleached boards to include an additional variety: Algro Design Advanced. This gives customers a choice of four different reverse side surfaces within the popular Algro

The new paperboard Algro Design Advanced has a lightly coated reverse side. This results in excellent color absorption and a new level of color brilliance.





Targeted finishing options such as embossing, foil stamping, die-cutting or varnish enhance the user experience even further.

AS PART OF THE ONGOING DEVELOPMENT OF THE POPULAR ALGRO DESIGN PAPERBOARD, THE TERM “NATURE” IS NOW ADDED. THIS FURTHER UNDERLINES THE BRAND’S NATURAL LOOK ON THE UNCOATED REVERSE SIDE AND ITS HAPTIC CHARACTER.

Design portfolio, which means one more paperboard variety than before. The paperboards differ with regard to the reverse side coating; the top sides are identical and always double coated. As part of the ongoing development of the popular Algro Design paperboard, the term “Nature” is now added. This further underlines the brand’s natural look on the uncoated reverse side and its haptic character. A specification of this kind is in great demand today, as the reverse side of the paperboard is being used more and more frequently as the outward face of a finished box. The product itself and all properties remain the same.

REVERSE SIDE CAN BE USED FOR BRAND COMMUNICATION

Algro Design Advances is a further development of Algro Design Nature (formerly Algro Design). Its reverse side is lightly coated, resulting in very even color absorption and a new level of color brilliance. The range of available grammages from 220 to 380 g/m² is similar to that of

Algro Design Nature. The specification and tolerance values are identical to the Algro Design Nature values, so no adjustments are required for the physical values or further processing. “The new Algro Design Advanced gives our customers the utmost flexibility in designing their product packaging. Its lightly coated reverse side offers significantly more potential for projects with higher ink coverage, more brilliance, greater contrast and more versatile finishing options”, says Lars Scheidweiler, Product Group Manager Paperboard at Sappi Europe, explaining the exciting expansion of this paperboard portfolio. The print results are impressive. Targeted finishing options such as embossing, foil stamping, die-cutting or varnish enhance the user experience even further.

The two paperboards Algro Design Card and Algro Design Duo remain unchanged. They complement the new, more differentiated portfolio of the Sappi Algro Design paperboard for more design scope on the reverse surface.

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