Contineo Media

September-October 2017
www.asiafoodjournal.com
ISSN 2010-4200 MCI (P) 096/05/2016 PPS1595/07/2013 (022965)

Your Professional Guide to Ingredients and Processing

Asia Food JOURNAL

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High-intensity Sweeteners in Asia

Choosing the Right Probiotic Ingredient

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Editor's Note

Attend, learn and participate

It has been a busy few weeks for the food manufacturing industry, especially our peers in the ingredients sector. September is the month of trade shows in the region. Three of the prominent exhibitions were held just a few days ago: Asia Fruit Logistica, Food Ingredients Asia, and Vitafoods Asia. Did you check out at least one of these?

If you did, then you would have learned about the exciting new ingredients and finished products that were showcased at these exhibitions. At Vitafoods Asia, LESAFFRE introduced Lynside ProteYn, a new line of yeast proteins that offers nutritional benefits comparable to other protein sources, but without the allergen issues that turn consumers away from soy or dairy; Metarom unveiled a weight management drink where the active ingredient (Fytexia Sinetrol) is masked by their flavor solution; Gelita presented the potential for bioactive collagen peptides to stimulate body function; and Diana Foods introduced Glucophenol, a natural health solution for glucose regulation. At Fi Asia, Tate & Lyle showcased its Claria instant functional clean-label starches and Optimizer stevia natural sweetener; ADM brought its CLARISOY soy protein, which allows for replacement of dairy proteins in pH-neutral products; and Corbion introduced its Verdad range of fermented cane sugar and/or vinegar which has the potential to replace chemical preservatives in chilled foods, meat products, sauces and dips.

Meanwhile, the overwhelming emphases in this year's breakout sessions and forums were plant protein, clean label, sugar reduction, microbiota, and ingredients that address healthy aging and weight management. As always been in the past, the forums had low attendee engagement. The challenge in this region has always been to encourage participation and collaborative learning in discussion forums. We hope to see improvements in the near future.

Registering for a trade show – whether as an exhibitor or an attendee – is something many put off because of the expense and the trouble of having to set aside regular work responsibilities. Yet, despite these, there is still incredible value to be found. It is an excellent opportunity to network with vendors and peers, gain insight into the strategy of your competitors, discover the latest market trends and tech innovations, and get a fresh perspective on best industry practices. At the same time, you'll be promoting your brand and hopefully generate goodwill via face-to-face contact. This kind of information and interaction can be invaluable for your company and personal development, and allow you to plan wisely for the future.

Take the opportunity to attend, learn, participate and network. Hope we bump into each other in future events. In the meantime, have a good read!

Denice Cabel
Editor, Asia Food Journal

Asia Food JOURNAL

ISSN 2010-4200

ASIA FOOD JOURNAL IS PUBLISHED BY:

Contineo Media

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T: +65 6521 9777 F: +65 6521 9788
www.asiafoodjournal.com

Printer by Oxford Graphic Printers Pte Ltd

ASIA FOOD JOURNAL Volume 14, Number 5.

SEPTEMBER-OCTOBER 2017

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NESTLÉ TO ACQUIRE SWEET EARTH

Nestlé will acquire Sweet Earth, a plant-based foods manufacturer based in Moss Landing, Calif. The acquisition gives Nestlé immediate entry into the plant-based foods segment, which is growing by double digits and expected to become a US$5 billion market by 2020. Sweet Earth's portfolio spans all meal occasions, diversifying Nestlé's offering beyond its existing category leadership in meals and snacks.

"In the United States, we're experiencing a consumer shift toward plant-based proteins. In fact, as many as 50 percent of consumers now are seeking more plant-based foods in their diet and 40 percent are open to reducing their traditional meat consumption," said Paul Grimwood, Nestlé USA chairman and CEO. "One of Nestlé's strategic priorities is to build out our portfolio of vegetarian and flexitarian choices in line with modern health trends."

Sweet Earth produces its product lines (48 items) in a 40,000-square-foot facility at its Moss Landing headquarters. Sweet Earth's on-trend products feature global flavors and plant-based proteins like seitan (wheat-based), tofu and legumes like lentils, chickpeas and beans. Sweet Earth's products span three core platforms: entrees, breakfast and plant-based proteins, called Righteous Meats.

Sweet Earth will continue to be led by Kelly and Brian Swette; the business will remain independent with support from Nestlé USA's Food Division.

The Sweet Earth acquisition follows Nestlé's recent equity stake in Freshly, a direct-to-consumer delivery service, and continues the company's evolution into new products and categories to match changing consumer preferences.

Grab&Go

INDUSTRY NEWS

Fonterra opens Australia plant to target Chinese pizza lovers

Mozzarella made at Fonterra's Stanhope cheese plant in Northern Victoria will soon be topping pizzas at restaurants in China, as Fonterra's Australian business moves to take a bigger slice of pizza's popularity in the Asian nation.

The first mozzarella is rolling off the line as Fonterra's new cheese plant in Stanhope is being commissioned in readiness to start global production in the coming months, bringing Fonterra's mozzarella production back to Australia for the first time since 2013.

Fonterra Australia's managing director, René Dedoncker, says it is a significant step for our Australian business to resume making mozzarella for the domestic and export market, particularly China where there is strong demand for our cheese.

"New Zealand-made Fonterra cheese is already topping more than half the pizzas made in China, and now we will be sending our Australian-made mozzarella as our customers just can't get enough of it. In China, the growth in Western-style foodservice outlets has meant more opportunities for Chinese people to try cheese and many are developing a taste for it, particularly on pizza. The market potential is enormous," said Dedoncker.

Jared and Courtney Ireland run a 450-cow dairy farm in the rural town of Lockington in Northern Victoria. Their fresh milk is supplied to Fonterra's Stanhope plant and will be used to make mozzarella destined for China. Jared says he's proud to know their farm's high-quality milk is making its way into higher value products like mozzarella for the food service industry in China.

"My family loves eating pizza with its stretchy mozzarella. Knowing where our milk goes, we can tell our children that our farm's milk goes into making mozzarella to top pizzas for families to enjoy in China. With Stanhope's new cheese plant coming online, positive news like this gives us confidence in a strong, sustainable future for dairy in Australia," said Jared.

Forty percent of people in urban China now eat at Western-style fast food outlets once a week, and the use of dairy in foodservice has grown by over 30 percent in just five years. Seventy-three percent of Chinese consumers are willing to pay a premium price for items proven to be healthier, such as dairy, which is 12 percent above the worldwide average.

"As disposable incomes rise in China, spending on dining out is growing, and pizza is a very popular menu choice. They want the extra stretch, softness and flavor of our mozzarella made with high-quality Australian milk," said René.

"This supports our strategy to be Fonterra's global ingredients hub for cheese, whey and nutritionals, complementing our consumer and foodservice businesses. This helps us move our farmers' milk up the value chain into higher-value dairy products, which means sustainable returns for everyone in the supply chain, starting at the farm gate," said René.

Industry Updates

IMCD COMPLETES ACQUISITION OF L.V. LOMAS

IMCD N.V., a distributor of speciality chemicals and food ingredients, has completed the acquisition of 100% of the Canadian and US specialty and ingredients distributor L.V. Lomas.

Established in 1960 and with activities at six locations in Canada and the US, including offices in Toronto (Head Office), Montreal and Vancouver, L.V. Lomas is one of North Americas leading distributors of specialty chemicals, ingredients and raw materials and is distinguished by its experienced and qualified professionals that provide its customers with advanced technical support and market intelligence. In 2016, the acquired business of L.V. Lomas generated revenue of C$383 million and realized a normalized EBITDA of C$18 million with approximately 280 employees.

DUPONT INVESTS US$10MN TO UPGRADE PROBIOTIC FACILITY

DuPont Nutrition & Health has invested US$10 million to upgrade to its probiotics pilot facility in Madison, Wisconsin. The investment allows for increased pace of new product development and significantly improved delivery times on pilot material for clinical trials and customer evaluations. Construction on the Madison probiotics pilot area, completed in phases over the last six months, provides increased capacity and speed for new product development. This in turn improves overall scale up capability and a more seamless transition to commercial scale production. The pilot area features new, state-of-the-art equipment, data collection, laboratories, instrumentation and specialized workspace for probiotic development and scale up. The upgrades that quadrupled the pilot area have already increased bandwidth to simultaneously run more development projects while improving scale up efficiency and time to market.

BUSINESS

Mars Food to acquire majority stake in Tasty Bite

Mars Food has signed a definitive agreement to acquire Preferred Brands International, a Stamford, Connecticut-based, fully integrated manufacturer and marketer of all-natural, ready-to-heat Indian and Asian food products sold primarily under the Tasty Bite brand.

Tasty Bite's portfolio includes a wide range of vegetarian offerings, including Indian/Asian entrees, spice and simmer meal kits, and organic rice and lentils. While the majority of sales are generated in North America, Preferred Brands International also manufactures products that are sold through retailers in the UK and Australia and through foodservice in India.

The agreement brings together two strong food businesses focused on delivering healthy, tasty, and convenient foods that bring inspiration and enjoyment to the world's dinner table. Mars Food, a segment of Mars, Incorporated, has a broad portfolio of brands loved by consumers around the world, including ready-to-eat and dry rices and grains, sauces, meal kits, meal helpers, and spices under the brands UNCLE BEN'S, MASTERFOODS, DOLMIO, SEEDS OF CHANGE, and others.

Tasty Bite manufactures products out of its Pune, India manufacturing facility and exports the majority of its products to the US. Preferred Brands International also enjoys a significant foodservice business under which it supplies food products to other leading food manufacturers and quick service restaurants in India.

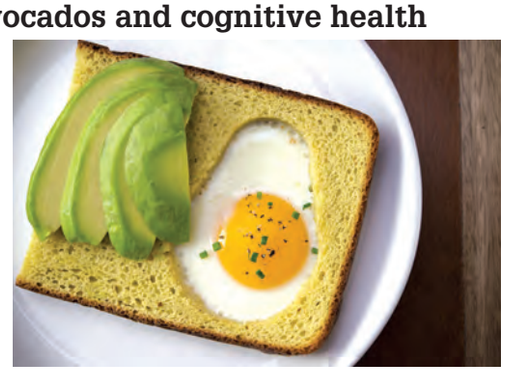
Tasty Bite has a subsidiary that is listed on the Bombay Stock Exchange and the National Stock Exchange of India. This subsidiary will continue to be listed after the acquisition.

"Tasty Bite's broad range of dinner time products, focused on Indian and Asian cuisines, makes it a natural complement to our existing portfolio," said Mars Food global president Fiona Dawson. "Tasty Bite is a fast growing Indian/Asian dinner time brand. Upon closing of the acquisition of Tasty Bite, Mars Food will expand our all-natural vegetarian offerings in the US, and leverage Tasty Bite's strong product development pipeline, flavor expertise, and strategic sourcing of quality ingredients throughout our portfolio."

"We're thrilled to be joining the Mars Food family," said Tasty Bite CEO Ashok Vasudevan. "The nearly quarter century of uninterrupted growth of Tasty Bite since its inception was powered by our deep commitment to sustainable practices and to the pursuit of consumer delight.

DISCOVERY

Research finds connection between avocados and cognitive health



Tufts University has released results of a study linking eating avocados to helping improve cognitive brain function in older adults, news especially relevant to Hispanics who have been found to have the longest life expectancy rate in the US Published in the journal Nutrients and supported by the USDA and the Hass Avocado Board, the research tracked how 40 healthy adults ages 50 and over who ate one fresh avocado a day for six months experienced a 25% increase in lutein levels in their eyes and significantly improved working memory and problem-solving skills.

Lutein is a type of carotenoid antioxidant, or pigment, commonly found in fruits and vegetables already widely accepted to have a role in preserving eye health and now increasingly thought to have a positive impact on brain health as well. As study participants incorporated one medium avocado into their daily diet, researchers monitored gradual growth in the amount of lutein in their eyes and progressive improvement in cognition skills as measured by tests designed to evaluate memory, processing speed and attention levels. In contrast, the control group which did not eat avocados experienced fewer improvements in cognitive health during the study period.

"The results of this study suggest that the monounsaturated fats, fiber, lutein and other bioactives make avocados particularly effective at enriching neural lutein levels, which may provide benefits for not only eye health, but for brain health," said Elizabeth Johnson, Ph.D., lead investigator of the study from the Jean Mayer USDA Human Nutrition Research Center on Aging, at Tufts University. "Furthermore, the results of this new research reveal that macular pigment density more than doubled in subjects that consumed fresh avocados, compared to a supplement, as evidenced by my previous published research. Thus, a balanced diet that includes fresh avocados may be an effective strategy for cognitive health."

"Tuft's findings that eating avocados is linked to a positive impact on memory is one more reason to enjoy healthy avocados daily. It's especially good news for Hispanic households where avocados are already so popular and older generations are culturally central to the core family unit," said Emiliano Escobedo, executive director of the Hass Avocado Board. "More research is needed in different populations with different amounts of avocado to better understand the connection between avocados and brain health."

INDUSTRY NEWS

Dow, DuPont merger is finally complete

Nearly two years after Dow Chemical Co. first announced plans to merge the company with DuPont Co., the "historic transaction" is complete. The companies closed their US$130 billion merger, bringing together two chemical industry giants to form a new company named DowDuPont. The combined entity will operating as a holding company under the name “DowDuPont” with three divisions: agriculture, materials science and specialty products.

“Today marks a significant milestone in the storied histories of our two companies,” said Andrew Liveris, executive chairman of DowDuPont. “We are extremely excited to complete this transformational merger and move forward to create three intended industry-leading, independent, publicly traded companies. While our collective heritage and strength are impressive, the true value of this merger lies in the intended creation of three industry powerhouses that will define their markets and drive growth for the benefit of all stakeholders. Our teams have been working for more than a year on integration planning, and – as of today – we will hit the ground running on executing those plans with an intention to complete the separations as quickly as possible.”

“For shareholders, customers and employees, closing this transaction is a definitive step toward unlocking higher value and greater opportunities through a future built on sustainable growth and innovation,” said Ed Breen, chief executive officer of DowDuPont.

“DowDuPont is a launching pad for three intended strong companies that will be better positioned to reinvest in science and innovation, solve our customers’ ever-evolving challenges, and generate long-term returns for our shareholders. With the merger now complete, our focus is on finalizing the organizational structures that will be the foundations of these three intended strong companies and capturing the synergies to unlock value. With clear focus, market visibility and more productive R&D, each intended company will be equipped to compete successfully as an industry leader.”

BUSINESS

Taiyo's new WGCP boasts continuous alertness without the side effects

Taiyo’s new functional WGCP (whole green coffee powder) is derived from raw coffee beans using a patented technology. It improves both mental focus and concentration for up to 6-8 hours, helps to reduce and stabilize blood glucose levels and can act as an appetite suppressant. As compared with coffee extracts, WGCP powder also has several other valuable coffee bean components, such as chlorogenic acids, antioxidants, minerals and dietary fibres.

This natural raw coffee bean ingredient delivers sustained caffeine release. Where caffeinated beverages often provide a short-term peak of heightened alertness, WGCP offers a continuous supply of caffeine for a period of 6-8 hours without the associated side-effects of jitters, a rapid heartbeat and the well-known “boom and bust” phenomenon.

As such, WGCP is suitable for “natural” and “gentle” energy products as well as “concentration” or “endurance and performance” positioning. It can also be marketed as a weight management ingredient owing to its appetite suppressing effect.

WGCP can be incorporated into a variety of food formulations, such breakfast cereals, oatmeal, granola bars and drinks, and dietary supplents such as protein powders, shots or capsules.

Developed in collaboration with physicians, WGCP’s efficacy has been demonstrated in clinical studies and, as the ingredient is vegan, free from gluten and non-GMO, it meets current consumer demands.

Industry Updates

PALSGAARD OPENS APPLICATION CENTER IN SHANGHAI

Palsgaard has opened a new application center in Shanghai, China, targeting the needs of Chinese manufacturers and taking advantage of a bright future for sustainable emulsifiers. Food safety and sustainability are creating new opportunities for Palsgaard, particularly in Asia, as the pressure of consumer emphasis on healthier foods continues to mount.

The brand new Shanghai center includes a fully equipped bakery where the company's bakery application specialists can help customers test and develop new recipes for cake mixes based on the company's unique Emulpals and Palsgaard SA ranges. These powdered emulsifiers are very easy to work with and can be used for aerated and non-aerated cakes in bakers' mixes, retail mixes and industrial cakes. They offer the versatility, uniformity and robustness required by each type of cake and production process – as well as the right aeration, moisture control, crumb structure and health profile. The new bakery also includes facilities for producing cake gels based on Palsgaard's emulsifiers and allows manufacturers to test the effect of their cake gels on site.

New ice cream application facilities are also in place at the Shanghai center, enabling Palsgaard specialists to help customers incorporate highly functional emulsifier/stabilizer systems in ice creams to achieve just the right mouth-feel, creaminess, melt-down properties and fat content. Additionally, the center can help to protect products against the effects of heat shock, which is becoming a focal point for ice cream manufacturers keen to maintain quality once the product leaves the factory.

PRODUCT LAUNCH

Corbion unveils new antimicrobial for meat mold inhibition

Corbion launches the meat industry's first clean-label antimicrobial that rivals potassium sorbate for mold inhibition, even in applications most vulnerable to mold. With consumer demand for meat snacks continuing its upward trajectory, marketers are introducing an increasing array of varieties and formats, including softer, high-moisture products. But those high-moisture meat snacks and pet treats are more susceptible to mold spoilage and also helps to control the Staphylococcus aureus outgrowth, and the traditional solution for dealing with that challenge – potassium sorbate – is turning off a growing number of label-conscious consumers. That is why Corbion has developed Verdad Opti Powder XM10, a clean-label antimicrobial solution that is highly effective at inhibiting mold growth, in addition to providing pathogen protection and longer shelf life.

"The ability of Verdad Opti Powder XM10 to provide outstanding control of pathogens and spoilage organisms is a critical competitive asset for processors," said Tom Rourke, Ph.D., director business development at Corbion, "but in applications where mold control is a particular challenge, that's where it really stands out as something uniquely powerful. Being able to tackle the mold spoilage challenge without alienating consumers looking for a clean ingredient label just hasn't been possible before now. We believe this product can really impact sales for our customers."

The company's Verdad range of solutions is based on ingredients such as vinegars, ferment blends, citrus flour and natural flavor, enabling more consumer-friendly ingredient labeling while extending shelf life, improving yield, and enhancing safety without sacrificing quality.

MARKET TREND

Global demand for chocolate is showing recovery

The global demand for chocolate is now showing recovery and leading suppliers are expecting stabilization of demand in the key markets worldwide. By 2020, the US is expected to be the largest consumer of chocolate globally, followed by Russia; while India and China are countries projected to have the highest chocolate market growth in the period 2015-2020. Economic conditions in Brazil and Russia have been hampering the chocolate market's growth.

It is expected that the global chocolate market will grow at a CAGR of approximately 5% through 2020. New flavors coupled with product packaging innovations will be the trend going forward. World over, there is growth potential in the customized and luxury chocolate segments. People have a rising affinity for handcrafted chocolate and many startups are dappling in the art of chocolate making. Popularity of premium chocolates is on the rise particularly in the US and Brazil. While rising obesity and health concerns worldwide is a challenge for the growth of the sector, there is also growing awareness about the benefits of dark chocolate. Players have also been introducing low sugar and sugarless chocolates.

ACQUISITION

Frutarom snaps up Swiss savory solutions company Mühlehof

Frutarom has acquired Swiss company Mühlehof Gewürze AG for approximately US$7 million. The transaction was completed upon signing and financed through bank debt. According to Mühlehof management reports, its sales turnover for the 12 months ending in June 2017 totaled approximately US$ 3.4 million.

Mühlehof, which was founded in 1979, engages in the development, production and marketing of savory taste solutions (the non-sweet spectrum of flavors), including flavors, seasoning blends, marinades and functional ingredients for the food industry, with emphasis on convenience foods and meats. Mühlehof, with nine employees, has a site in Switzerland for development, manufacturing and marketing which is included among the acquired assets.

The acquisition of Mühlehof will strengthen Frutarom's market leadership in Switzerland, allowing it to continue expanding and deepening its activity and market share in the country and to generate and exploit synergies in the areas of R&D, sales, operations, purchasing and logistics and attaining significant savings from the merger.

The global market for savory flavors is growing due to the rise in standard of living and changes in lifestyle and consumer habits bringing about increased demand for processed and convenience foods both for home consumption and for eating out. Frutarom embarked about 10 years ago on a strategic course of action to significantly build up its global savory activity by acquiring leading companies in their fields possessing unique solutions and a strong position in strategic target markets. Among the companies and activities acquired: Nesse, Gewürzmüller and the savory activity of Chr. Hansen in Germany (in 2006, 2007 and 2009 respectively); EAFI in the UK, the savory activities of Rieber in Norway, US-based FSI and the savory activities of Chr. Hansen in Italy in 2011; Savoury Flavours in the UK and ETOL in 2012; JannDeRee in South Africa and PTI in Russia in 2013; FoodBlenders in the UK and BSA of Canada, with activity also in India, in 2015; and AMCO of Poland, Wiberg of Austria, Redbrook of Ireland and Piasa of Mexico in 2016; and Unique Flavors in South Africa in 2017.

Barry Callebaut launches studio in Bandung, Indonesia

Barry Callebaut has launched its first BC Studio in Asia. Built with a vision to cater to the evolving needs of food manufacturers and their markets in the region, the new BC Studio in Bandung, Indonesia, is a great addition to the company's host of innovation capabilities.

Passionately speaking on what the new BC Studio brings to Asia in his welcome speech at the Opening of the Studio today, Ben De Schryver, regional president, Barry Callebaut, Asia Pacific, said, "BC Studio is all about co-creation. Co-creation is a truly unique journey where we leverage our market and consumer understanding, our cocoa and chocolate expertise, as well as our network of trendsetting and creative chefs to build relevant and differentiating brand experiences together."

Co-create & collaborate

In essence, Barry Callebaut makes inspiring chocolate and cocoa dreams come true. It is an innovation center where good quality ingredients are combined with expertise and passion to develop inspiring new ideas and creations. It is also the place-to-be for a sneak peek at what is up-to-minute and what defines the chocolate and cocoa experiences of tomorrow.

Equipped with the latest kitchen applications such as ovens, dough and ice cream maker, the new BC Studio offers endless potential for the exercising of creativity in confectionery applications. There is also a contemporary open kitchen space for customers to get up close and personal to the "craftsmen at work" and be inspired by their live action.

Aim to inspire

Some of the other key elements of the studio are a carefully curated inspirational space as well as a break out lounge area for customers to engage in insightful discussions with Barry Callebaut's sales, product development teams and chefs within a relaxed setting.

The teams in the new BC Studio can provide valuable global insights on trends and create products specific to a customer's request. They may also simply display a range of new applications for a customer to see. The studio is primed to provide tailor made solutions and ideas for cakes, pastries, ice-cream, beverages and many more.

With a wide variety of premium quality and innovative specialty products, including chocolate, cocoa, coatings and fillings, the BC Studio bubbles with potential for food manufacturers. Especially so with the launch of several new Bensdorp cocoa powders, these products can be used for a broad range of applications and to cater to a customer's personalized needs and wants.

Industry Updates

FLYING SPARK JOINS IKEA'S START-UP ACCELERATOR

Flying SpArk, a new insect-protein producer, will join the first "IKEA Bootcamp" start-up accelerator. The launch of this unique boot camp generated more than 1,200 applications from 86 different countries, but just 10 start-ups will join the IKEA product development center in Sweden, as of September 18, 2017.

Flying SpArk is a new food-tech company focused on all-natural protein extracted from the Mediterranean fruit fly for human consumption. This safe, sustainable ingredient is high in protein, calcium, iron and potassium and, unlike meat, it is odorless and virtually cholesterol-free.

In just one more generation, the world population will surpass 9 billion, with about half suffering from inadequate nutrition. One of the primary reasons IKEA chose Flying SpArk is because of the mission of co-founders Eran Gronich and Yoram Yerushalmi: to create a high-quality protein ingredient packed with essential minerals, raised and harvested according to sustainable principles. Fruit fly farming requires minimal water and almost no land. The flies harvest themselves with no human intervention, which allows for clean farming.

The idea behind IKEA's collaborative boot camp effort is what the company calls, "Co-creating a better, everyday life." The mission is to encourage start-ups that are working to solve some of the world's most pressing problems. IKEA owns and operates 389 stores in 48 countries. Its income from foods last year was an estimated €2 billion.

MARKET TREND

Consumption of ice cream as a snack is on the rise in China

Ice cream remains a popular summertime treat for many and new Mintel research reveals that consumption of the sweet indulgence is on the rise. Today, half (49%) of urban Chinese consumers* say they eat ice cream at home as a snack, compared to four in 10 (39%) who said the same in 2015. Meanwhile, 39% of urban Chinese consumers report eating ice cream as a dessert this year, compared to just over one in four (28%) who said the same two years ago.

Overall, the ice cream market in China has seen a decline in retail volume, with a CAGR of -1.6% between 2014 and 2016. However, the total retail market value is on the rise due to consumers trading up for new formats and flavors.

Better-for-you options are among the more popular premium features; 59% of urban Chinese consumers are willing to buy ice cream products that feature a '100% natural/no additive' claim, especially among soft-serve ice cream users (68%). What's more, consumers aged 30-39 say they are willing to pay more for '100% natural/no additive' products (65% compared to 59% of consumers overall).

Cheryl Ni, food and drink analyst at Mintel, said: "Urban Chinese consumers are paying more attention to their health, while still looking for opportunities for indulgence, which should not be compromised. Given the fact that more consumers today are eating ice cream as a snack or a dessert at home compared to previous years, family-size tubs or multipack offerings will have further opportunities. Also, there is scope for ice cream to be positioned as 'mood food', allowing consumers – especially the younger generations – the ability to soothe life's stresses away as they indulge in a treat while paying a premium price for it."

Meanwhile, declining consumption appears in both retail and non-retail channels. Mintel research indicates that the percentage of ice cream non-users has risen from 4% in 2012 to 11% in 2017. In all, purchases at retail channels (net) (76%) is lower than non-retail channels (net) (93%), with the number of urban Chinese consumers who bought ice cream from supermarkets/hypermarkets declining from 85% in 2012 to 52% in 2017. Similar declines can be seen at grocery retailers, which dropped from 42% to 12% in the same time period.

All that said, the market has experienced significant growth in online channels, including online brand stores (e.g., official store in Tmall), increasing from 3% to 16% between 2012 and 2017. Mintel research indicates that this growth is driven by high earners** who are more likely to be fans of online channels (23%).

"Shopping for ice cream products from online retailers is usually more expensive given the cost of cold chain delivery. However, we are seeing a growing number of imported ice cream brands available in online stores, providing more premium choices for consumers with a higher spending power," said Ni.

More Chinese consumers in tier one cities claim to eat packaged ice cream as a snack during their leisure time, especially those located in Shanghai (57% vs. 49% of consumers overall). On the different occasions for eating ice cream that is made on-the-spot, consumers in Shanghai show a higher interest in this format when they are hanging out (54%, compared to a total 47%) or when they are craving something sweet (41%, compared to a total 34%). When it comes to location, ice cream parlors, dessert shops and coffee shops seem to be their favorite spots for eating ice cream.

Finally, it appears that young urban Chinese consumers aged 20-24 are particularly interested in value-added features, such as 'edible containers that taste good' (42%), 'customized flavors/shapes' (35%) and 'innovative packaging' (33%). Products with clean label claims and added nutrition will encourage trading up in this category. In the meantime, healthier versions should not compromise indulgence, especially for tier one Chinese consumers.

"The shift in consumption occasions redefines the ice cream market which is no longer an alternative to a cooling drink, but an indulgent treat that can bring a sense of enjoyment and happiness. Consumers in tier one cities prefer healthy versions of ice cream, but they don't want to compromise on enjoyment, and this is why manufacturers should optimize recipes to achieve a balance of both," Ni concluded.

**3,000 Internet users in tier 1-3 cities aged 20-49; survey conducted March 2017*

*** Definition of high household income, RMB>=16,000 from tier one cities, RMB>=14,000 from tier two and three cities*

PEOPLE

DSM Nutritional Products appoints new Asia-Pacific leadership

Royal DSM, a global science-based company active in health, nutrition and materials, has appointed Pieter Nuboer as Asia-Pacific vice president of Animal Nutrition & Health and André Rhoen as Asia-Pacific vice president of Human Nutrition & Health. Nuboer retains his additional position as Asia-Pacific president of DSM Nutritional Products.

Pieter Nuboer joined DSM in 2009 to lead human nutrition and health activities in Asia-Pacific. In his new position focusing on the animal nutrition and health business, he will report to David Blakemore, global president of Animal Nutrition & Health.

Nuboer succeeds Karim Kurmaly, who joins a joint venture, to be established together with Evonik, to be named Veramaris. It will produce, for the first time, omega-3 fatty acids for animal nutrition from natural marine algae instead of using fish oil from wild caught fish, a finite resource – protecting the ecological balance and biodiversity of the oceans and further advancing DSM's sustainability innovations.

André Rhoen will lead the human nutrition and health business in Asia-Pacific. He joined DSM in 2001 and has held various positions in the Global Strategy & Acquisitions department and the Intermediates and Nutrition businesses.

Nuboer and Rhoen will be based in DSM's Asia-Pacific headquarters in Singapore, home to DSM's regional Nutrition Innovation Center which opened in 2015 to support the development of localized and appealing food, beverage, and dietary supplement products for customers in the region.

PEOPLE

Mondelēz CEO Irene Rosenfeld steps down, replaced by Van de Put

Mondelēz International has appointed Dirk Van de Put, current president and CEO of McCain Foods, to succeed Irene Rosenfeld as CEO of Mondelēz International, as she steps down effective November 2017. Van de Put will also join the company's Board of Directors. Rosenfeld will continue as chairman of the Board until March 31, 2018, at which point she will retire and Van de Put will assume the role of chairman and CEO.

"The Board and I are confident that Dirk Van de Put is the right leader to take us forward," said chairman and CEO Irene Rosenfeld. "He is a seasoned global CEO, having lived and worked on three different continents, with deep experience and expertise in all critical business and commercial operations in both emerging and developed markets."

Van de Put brings nearly 30 years of experience in the food and consumer package industry to this new leadership role. He joins Mondelēz International from McCain Foods, a US$7.3 billion privately held Canadian company that is the largest marketer and manufacturer of frozen french fries, potato specialties and appetizers with sales in more than 160 countries.

Prior to joining McCain, Van de Put held executive positions with Novartis, Groupe Danone, The Coca-Cola Company and Mars, Incorporated. He graduated with a Doctorate in Veterinary Medicine from the University of Gent in Belgium and a post-graduate in marketing and management from the University of Antwerp. Van de Put is fluent in five languages, including English, Dutch, French, Spanish and Portuguese.

MATERIALS HANDLING

The Rigors of Handling Food

Asia Food Journal's Denice Cabel interviews POUL LORENTZEN, General Manager of Consoveyo Singapore, about the latest trends in conveyor technologies for use in food manufacturing operations.

What are the types of conveyor technologies that F&B manufacturers in Asia prefer?

The application of conveyor technologies is fully dependent on a customer's requirements. Different customers will have different concerns to consider, such as transporting unit loads across one level, or over a few storeys. Additionally, factors such as the unit load itself, its size and shape, throughput, and distances will influence the type of conveyors that are employed.

Poul Lorentzen

The objective of a conveyor systems designer is to customize a transportation solution that the customer finds value in, which will lead to a perception of a worthy investment. The food and beverage (F&B) industry typically transports high volumes of products daily, so compared to other vertical markets, F&B companies may find it easier to justify investment in conveyor technologies.

Specific to the preferences of Asian F&B manufacturers, we have observed that companies tend to employ traditional pallet roller and chain conveyors. Sometimes, more sophisticated technologies like rail guided vehicles (RGV), overhead monorails, shutter cars, and lifters for interfloor pallet transportation are used. Belt conveyors are more popular for carton transportation.

At Consoveyo, we have RGV systems suitable for moderate throughput requirements as the system is capable of transporting pallet unit loads over longer distances. Separately, we have also delivered pallet lifters 45 meters in height, which have been popular for supporting larger F&B facilities.

Consoveyo has worked with established F&B companies in the past. How do these companies utilize conveyor systems in their logistics processes?

As the F&B industry is characterized by high throughput volume and the need for First In, First Out (FIFO) processes due to the perishable nature of the goods, conveyor systems have always been an integral part of material handling systems for manufacturers. With conveyor solutions, manufacturers can easily connect different areas of operations, from packaging to storage and retrieval for distribution to end customers seamlessly.

In a project with PT Smart in Indonesia, Consoveyo utilized a combined RGV and conveyor transport system to facilitate transportation between production lines to the stacker cranes for storage, retrieval, and dispatch. We also worked with another customer based in Singapore, where we used 45-meter high pallet lifters to facilitate vertical transportation across production floors, and to connect to the ground floor for dispatch.

With regard to shop floor transportation, the attraction for automated guided vehicle (AGV) is undeniable. Operating like driverless forklifts, AGVs can seamlessly transport pallets or trays between defined points without operators. For reason of economics, we are still to see a more widespread usage of AGVs in our region but there are signs of this changing right now. This year, a Hong Kong customer of ours in the Banking sector integrated several AGVs to transport unit loads within their facilities.

Does Consoveyo design specific warehousing solutions for SMEs in Asia?

Certainly, each warehouse solution is specifically designed for its application, even if standardized building blocks are used as much as possible. As Asia does not have a common standardized pallet, unlike Europe with its EUR pallets, we are often faced with the task of applying special design to accommodate a specific size or type of pallet.

As part of Korber's Logistics Systems, Consoveyo can leverage on its sister companies such as Aberle, Aberle Software, Inconso, Langhammer, Riantics, and most recently DMLogic and Highjump, to develop more specialized equipment and software solutions for our customers.

What are some common logistical challenges faced by Asian F&B manufacturers?

Unlike the Fast Moving Consumer Goods (FMCG) industry, some manufacturers within the F&B industry have to overcome the challenge of perishables. This industry has strict standards for hygienic transportation and storage practices. In turn, good visibility, and more importantly, traceability within the supply chain is required to quickly identify potential issues that may compromise food safety. When integrating material handling equipment, F&B manufacturers will also have to adopt gentle handling processes to avoid damaging food packaging. Fortunately, companies can employ technologies or consult with professional

material handling solutions providers who can tailor a system that would best fit their needs.

What are the top trends in F&B warehousing, and can you elaborate on them?

The overarching goal in F&B warehousing is to be more cost efficient while considering requirements such as food safety and inventory volumes. The rapid emergence of the e-commerce platform is one of most impactful trends in F&B warehousing. To cater to many different and smaller individual orders online, a variety of picking technologies are needed. Before the order picking process became automated, picking was traditionally done manually by warehouse operators, which was often quite time-consuming. Even though order picking technologies have come a long way since, onward transportation to on-line end customers is an area that is still developing rapidly.

The last mile is another top trend in F&B warehousing. Despite increased awareness and usage of e-commerce platforms, the final leg of delivery to the end customer remains an area within the logistics chain that can do with more automation. ■

CHOCOLATE

Inclusion Insights

This article explores the challenges chocolate manufacturers typically meet when working with inclusions – and proposes solutions for ensuring consistent, higher-quality results.

Producing consistently good quality chocolate is not without its challenges. Viscosity, new forming requirements and a long list of other aspects keep chocolatiers and production managers on their toes – and living in constant fear of producing a large batch that needs to be re-worked.

Now let's add inclusions to those realities. Take puffy rice crisps, for example. They are the equivalent of extreme sports for the chocolate manufacturer. Under vibration, and with a very light density, they do their best to avoid the mixture completely, tending to float on top of it. Nuts, on the other hand, are far denser and dive straight to the bottom. With perhaps just 15 seconds available for the chocolate to fit the mold, the ability to provide a perfect substrate for inclusions to position themselves and be properly enveloped in chocolate is worth its weight in gold.

Jørgen Holdgaard

The aim, therefore, is to transfer the flowing chocolate into a suitable working texture – one that can envelope inclusions and flow freely enough into difficult, obstructed spaces, yet without losing too much viscosity. In short, inclusions can drive you nuts.

Start here

So what can be done to overcome these challenges? First, let us review the basics of chocolate manufacturing machinery and methods. That is because variations in these are key to determining what measures to take to achieve the right results.

The chocolate matrix is normally composed of cocoa liquor, sugar, cocoa butter, milk powder (milk and white chocolate), emulsifier(s) (phospholipids, PGPR), and vanilla flavor. The workability and the final eating experience of the chocolate depend on the amount and type of the raw materials that the producer has chosen to put into the actual chocolate.

Producing the exact same recipe using different types of equipment will likely lead to quite different chocolates, varying in flavor, taste and viscosity profiles.

Traditional production

Manufacturing chocolate using a traditional machine setup requires mixing, refining and conching steps. In the first of these steps, the fat phase and all the powder materials are mixed together at approximately 122ºF (50ºC) to obtain a certain, soft clay-like refining texture. It is, in fact, the fat-to-particle ratio that regulates texture to be 'refiner-receivable'.

In the refining step, the mixer paste passes through rotating rolls. The rolls are hydraulically pressed together to create a defined gap be tween the sets of rolls until desired particle size has been reached. This size is determined by a number of factors such as time, temperature, speed of rotation and machine pressure. And in chocolate, with the human detection limit at around 18 to 20 microns, the maximum is usually in the interval of 20 to 25 microns for the largest particles.

The dry conching step requires the refiner flake to be blended at temperatures of approximately 140ºF to 160ºF with the rest of the fat. During the wet conching step, emulsifiers and flavor are added. The temperature selected depends on the type of chocolate: white, milk or dark, and the objective is to achieve the desired flavor profile and to adjust the viscosity profile to the chocolate's specification.

Production using a refiner/conche system

Integrated refiner/conche systems offer an alternative method of chocolate manufacture, performing the functions of a pre-mixer, refiner and conche all in a single machine. Refiner/conches can be used for making chocolate, compounds, coatings and fillings for small to medium production capacities.

Almost all raw materials go into the refiner/conche from the beginning. There is a limitation to texture during the refining part of the process as the machine needs a certain low viscosity during the process to avoid 'tumbling' and to conduct an acceptable refining process within a reasonable timeframe.

The first step in a refiner/conche approach is refining. The pressure of rotating blades towards the inner rippled wall is adjusted until the desired particle size is reached (a process that may take some hours, depending of the size of the machine used). When a final particle size of, for example, 25 microns has been reached, refining is interrupted and, without stopping, the machine is now used as a conche.

Conching continues after pressure has been released, at which point a wheel is turned to release pressure and end the refining function. The remainder of the fat is added during or at the end of the refining process. Emulsifiers are then added to modify viscosity to meet required specifications, and flavor is added as the final ingredient.

Manufacturing chocolate using ball mills

There are many different types of ball mill refining equipment in the marketplace – and a variety of different ways to conche the chocolate after refining. To begin with, powders are mixed with cocoa butter and cocoa liquor, along with some of the recipe's emulsifier. When the chocolate matrix is pumped through a tube filled with steel balls, the balls begin to roll (providing additional emulsifiers are added

to liquefy and lower the chocolate's viscosity), and the chocolate is refined until the desired particle size has been achieved. The product is then mixed, and its viscosity profile can be fine-tuned.

Key manufacturing parameters

Given the influence of the production process and machinery on the outcome of identical recipes, it is worth digging deeper into the production parameters that demand close attention in order to achieve chocolate of the right quality.

On the refining side of things, the smaller the desired particle size, the higher total fat the chocolate matrix demands. While this may not, at first, seem entirely logical, breaking any particle into, for example, four smaller fragments doubles its surface area. And each fragment's surface needs to be covered in fat before the rest of the fat in the matrix can create distance between the particles.

Then there are the conching considerations. Forming the chocolate's final viscosity profile is highly dependent on the conching machine used and the way it is operated. Gathering useful data on this parameter requires a modern viscometer, as well as a suitable measuring geometry and a water bath able to hold the sample at a constant temperature.

There are other important factors, too, in achieving a successful outcome. For example, the more intensive dry conching and shear applied, the lower the viscosity profile. There are process temperature limits, too, due to different types of chocolates and raw materials. And finally, the more volatiles that can be evaporated during the conching stage, the lower viscosity profile that can be achieved.

The challenge of inclusions

Chocolate inclusions span everything from coffee beans or fragments, to jellies, extruded corn or rice, dried fruits, cookies, to other types of chocolate or confections. When adding inclusions to a chocolate recipe, the chocolate's viscosity profile requires adjustment. On the one hand, a more liquid viscosity profile is required. On the other, manufacturers must avoid the feet formation that often accompanies such a profile when placed on a drying surface.

A viscosity profile measures three production-related shear rates that will inform us of the result we can expect during tablet molding, hollow figure spinning and enrobing applications where blowing is applied. A 'normal' molding profile, that is to say, one with a normal viscosity profile that generally works without problems for solid molding of standard tablets, resembles that depicted in **Figure 1**.

How does chocolate actually behave under different production situations at different speeds? By taking the chocolate through various viscosities, we learn what it can handle. Can it, for example, be used for producing Easter eggs in a spinning mold? Does it fall short for blowing applications by not having sufficient enrobing viscosity? Can it handle the extreme speeds of spraying?

Processability

To get to the bottom of this, it is useful to work with a flow curve method that generates the 'Casson' yield value and plastic viscosity. The Casson model describes what we might term the 'processability' of chocolate.

Basically, different types of molds require different chocolate profiles. The smaller and more narrow the mold, the lower the chocolate's viscosity needs to be. And changing the speed of the chocolate produces different viscosity results (non-Newtonian flow behavior). Furthermore, if impressions and logos are desired, additional liquid chocolate profiles are needed.

It is also important to establish enrobing profiles. The method used to do so is identical, but the results must be read differently. That is because layer thickness is often established at blowing speed with relatively fast shear rates, whereas molding takes place at relatively slow speeds. The speed of the chocolate in a chocolate

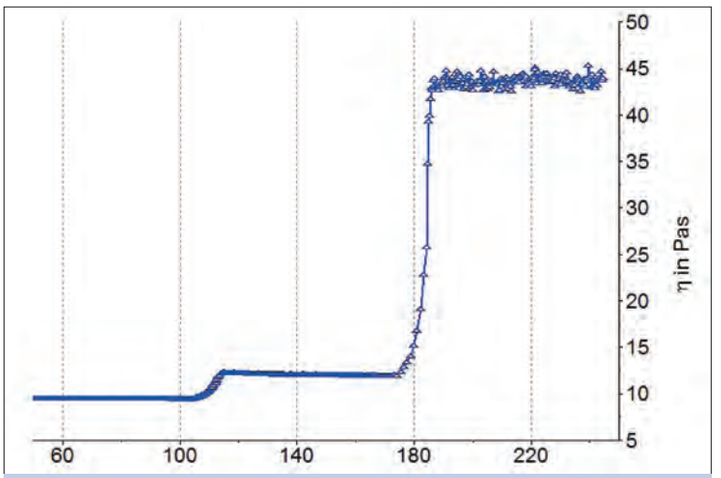


Figure 1: Example of 'normal' molding profile.

Figure 2: Incorrect viscosity may result in holes in the chocolate.

Figure 3: Migration of nut oil makes the chocolate bloom.

forming machine is therefore measured at approximately the same speed in a viscometer.

Inclusions and viscosity interact with the chocolate

What happens if we take a relatively fine chocolate that works well in a solid tablet molding line and apply chopped nuts, for example? The chocolate will now behave differently – and it is no longer suitable. Attempting to produce solid 100-200g tablets, therefore, will result in a product with holes in its surface (as shown in **Figure 2**).

Why? One reason is that, by adding chopped nut pieces, we have added even more surface area that needs to be covered in the chocolate fat phase. Another is that, by adding physical solids, blocking can occur within the mold. To overcome these challenges, therefore, we need to work with a chocolate that has a lower viscosity profile – enabling it to live up to the physical requirements of a mold containing inclusions.

The challenges don't stop there, however. Given that inclusions need to be covered with cocoa butter, relatively less fat is now available for creating distance between the molecules in the chocolate matrix.

Inclusions, such as nuts, are high in nut oil, and happily allow some of this fat content to migrate to the chocolate, contributing to the unsightly effects of chocolate blooming. **Figure 3** provides an example of fat blooming, with nut oil migrating into a milk chocolate and blooming spreading out from the nut inclusions.

At the same time, many inclusions such as dried fruits are high in moisture, disturbing the chocolate's own moisture levels and affecting viscosity control. Of course, it is not a one-way street: The chocolate fat phase can also migrate into the inclusion before crystallization, changing its texture so that those nuts are not quite as crisp and crunchy as consumers expect.

Perhaps the most obvious solution to these problems is to encapsulate the inclusion. This can be done with film-forming agents such as gum arabic solution or acetylated mono-glycerides. Coating the inclusion with a fat barrier may also work to prevent fat blooming. And last, manufacturers can choose to seal the inclusion with a film of chocolate.

More liquid please

One thing is quite certain: Adding inclusions requires a more liquid chocolate to ensure the inclusions are covered and the chocolate still fits the mold perfectly. But how much more liquid does the chocolate need to be? The best way to discover this, naturally, is to conduct trials. Once the new specifications have been identified, the recipe can be altered to match them in one of two ways.

The more traditional approach is to simply add more cocoa butter until viscosity numbers are met – but with cocoa butter at a premium and the adverse effects on taste and texture of adding too much cocoa butter, there is a better solution: the use of more efficient emulsifiers such as phospholipids (lecithin or emulsifier YN) together with PGPR. The hydrophilic PGPR finds the water, lubricating sugar surfaces with a fat-like coating and causing friction between particles to be lowered.

A good emulsifier system can reduce interaction among particles by coating sugars so they are unable to absorb as much moisture and thus lead to a thickening in viscosity. And vegetable-based emulsifiers (phospholipid AMP and PGPR) have the added advantages of being non-GMO and non-allergenic.

While there is no direct effect on chocolate production, these ingredients can be made using sustainable palm oil ingredients. Such emulsifiers are a powerful addition to the chocolate maker's toolbox, allowing more accurate control over the various parameters in chocolate production, and making it possible, for example, to reduce cocoa butter without affecting viscosity.

Success in a nutshell

In conclusion, the essence of successfully adding inclusions to your chocolate products is fourfold: establish a proper viscosity profile; find out if a sealing process is required; make the necessary recipe changes; and produce or order a suitable chocolate for the task at hand. Get these aspects right and from here on, adding inclusions to a chocolate should be a piece of cake. ■

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X-RAY INSPECTION

Meat & Poultry Inspection

Here's a checklist designed for meat and poultry processors to identify the best possible solution for their operation.

Investing in new equipment for a meat or poultry processing line can be a complex procedure, and choosing x-ray inspection technology is no exception. Processors have a lot to consider, from the system's suitability for the products being produced, to the compatibility with existing machinery on the production line. In addition, capital expenditure of this level is always heavily scrutinized, therefore anticipated return on investment (ROI) and total cost of ownership (TCO) statistics are very important and should be transparent. So how can meat and poultry processors ensure they select the most appropriate x-ray inspection system for the needs of their production line and their business? Here we have created a checklist, designed to enable processors to identify the best possible solution for their operation.

1. Conduct a hazard analysis

Production lines can vary considerably and each will come with its own threats to product quality and safety. For the meat and poultry, industry a number of foreign bodies can present a contamination risk. Components from production line equipment may break off and enter the production line, for example, or a knife broken off during the disassembly process may go unnoticed by the operative. Metal, glass, dense plastics or rubber, mineral stone and calcified bone are also potential contaminants and must be screened effectively in order to protect both consumers and the brand reputation of the manufacturer.

To understand precisely what hazards threaten the production line in question, it is imperative that meat and poultry processors carry out a Hazard Analysis and Critical Control Point (HACCP) audit. This is a comprehensive study of the entire production line to identify the points on the line most vulnerable to contamination. This will, in turn, help the manufacturer to understand which foreign bodies are most likely to contaminate their products and ultimately which product inspection system will be best suited to their operation. For example, if the line is most vulnerable to contamination from metal shards then, depending on the packaging format used, the producer should opt for a metal detector. If the contaminant threat is from multiple contaminants, then an x-ray solution will be more suitable.

For the meat and poultry industry, hygiene is also of great importance. Systems from Mettler-Toledo are designed to meet EHEDG (European Hygienic Engineering & Design Group) and NSF (National Sanitation Foundation) hygienic design guidelines, which ensure lines in this sector can be sanitized thoroughly in a manner that will not lead to excessive downtime. Product inspection experts can support meat and poultry processors in conducting a HACCP audit in line with all relevant regulations.

2. Identify CCPs

Once manufacturers have identified the biggest contaminant threats to their line, they should then determine where on the line they would most benefit from having a product inspection system. The results of the HACCP audit will also help here, as it can help locate the relevant critical control points (CCPs) – the stages on the production line most vulnerable to foreign body contamination.

When selecting CCPs and choosing where to fit an x-ray solution, consideration should be given to rejecting contaminants as early as possible to both minimize the quantity and value of wasted product removed from the line, and reduce the extent of contamination. This will particularly be the case if contaminants are removed at the beginning of the production line, as the act of processing raw ingredients can lead to contaminants being broken into smaller fragments and spread out, ultimately becoming harder to detect or even potentially damaging machinery downstream.

Both the application and location of the CCPs will determine the type of x-ray inspection solution. For meat and poultry, products can be inspected in bulk flow, pipelined, unpackaged, packaged,

cooked, raw, frozen, dried, and everything in between. If product is being inspected and the CCP has been identified at the beginning of the line, then a specialist bulk flow system will be appropriate, as it is able to accurately remove the portion of the product which contains the contaminant without rejecting conforming product. If the CCP is identified at the end of the production line, an x-ray system capable of optimum inspection of packaged goods is more suitable. Whatever x-ray solution is chosen, it must be specifically designed for use on the identified CCPs.

3. Define commercial and operational needs

Before creating a shortlist of x-ray inspection machines, it is imperative that meat and poultry producers define their specific commercial and operational needs. The former is concerned with minimizing operating costs over the lifetime of the product inspection system and the overall production line, while the latter is about ensuring ease of use during processes, such as product changeovers, to keep production downtime to a minimum.

By looking at the system's overall equipment effectiveness (OEE) – how well the machine performs relative to its designed capacity – and its total cost of ownership (TCO), producers can understand how it will meet their commercial needs. For example, if a system offers a lower OEE, then it is likely that it will negatively impact line efficiency, undermining the productivity of the line. If the system has a higher TCO, then it is likely to cost more over its lifetime than alternative systems, also affecting efficiency. System manufacturers will be able to provide this information for producers to study. To help producers understand the effect of the system on their operational needs, it can be productive for manufacturers to make a wish list of what they desire from their x-ray inspection systems. Features such as an intuitive graphic user interface and accurate auto setup can facilitate system setup for faster product changeovers, reducing downtime and helping to maximize line productivity.

4. Understand the system's full capabilities

When considering x-ray inspection solutions, manufacturers should check the capabilities and key functions of their shortlisted equipment to ensure their final choice meets the requirements of their production line. They should think about the ease of use offered by the technology, and whether it enables quick and efficient product changeovers – a particularly important benefit for lines that need to carry out short product runs. It is also important to consider whether the x-ray system in question meets the hygiene and environmental requirements for the line it is to be installed on. Meat and poultry processing lines have rigorous wash-down regimes to uphold consumer safety, so the x-ray system chosen needs to be able to facilitate cleaning and withstand frequent contact with water and harsh chemicals.

X-ray solutions with an Ingress Protection (IP) 69 rating, for example, would be ideal in such a situation. Those that feature a stainless steel casing with sloping surfaces and curved edges can make cleaning easier by eliminating potential dirt traps where bacteria can thrive, reducing downtime and maximizing productivity.

In addition to this, thought should be given to whether the system is able to carry out inspection for other quality parameters beyond contaminant detection. For example, is it able to identify missing or broken components, or check seal integrity? Can it perform gross mass measurement, or inspect fill level for portion control? If it can perform these checks and detect contaminants simultaneously, then it will help meat and poultry producers uphold high product quality and a strong brand image, as well as ensuring compliance with food safety regulations.

5. Consider data monitoring solutions

In order to demonstrate due diligence in the event of a product recall, it will be necessary for producers to record and store product inspection data from across their production line to show that every possible measure has been taken to minimize safety risks. It is important for meat and poultry producers to consider the data monitoring options available to them when selecting their x-ray inspection systems to ensure their reputation is adequately protected in such a scenario.

Many x-ray inspection systems now feature data monitoring software to keep records of every pack they inspect and reject. However, there are technologies that offer advanced connectivity solutions. These enable data from across the production line to be recorded and stored at a remote, centralized location, facilitating access by authorized personnel in an event of a product recall, making it easier to locate the source of any contamination event.

Moreover, such connectivity options can simplify the setup and product changeover process for producers by allowing every inspection machine on the production line to be adjusted at the same time from a single interface. It can also allow the recording and monitoring of data relating to the performance of each machine on the line, enabling producers to identify and rectify adverse operating trends. This can streamline the maintenance process for the entire line and maximize OEE. Product inspection system experts can advise on the data monitoring and connectivity solutions available to help producers make the right choice to meet their individual needs.

6. What additional support is provided?

Meat and poultry producers should consider the level of support offered by the manufacturer of each x-ray system. Many suppliers will be able to provide guidance and on-site expertise throughout the installation stage to ensure the equipment is fitted and commissioned correctly to offer optimum performance. This may also include customizing the machine to specifically suit the layout of the line.

There are more and more suppliers that are also able to offer guidance and ongoing local technical support after the installation of the machine, to help carry out essential maintenance and help producers optimize OEE and reduce TCO. Some also offer remote machine performance monitoring packages to allow real-time preventative maintenance to take place without the need for technicians on-site. This can ensure the machine consistently operates at its best with no unnecessary downtime, maximizing line efficiency and productivity. In addition, more suppliers offer comprehensive warranties to producers for their systems, avoiding unexpected customer costs and giving producer's peace of mind that they have made the right purchasing decision. A generator warranty for an x-ray system, for example, is a distinct advantage in terms of total cost of ownership, as it guarantees the most expensive part of the system against unexpected outlay.

7. The checklist for optimum product safety

There are many factors to take into account when purchasing an x-ray inspection solution. It is important for meat and poultry producers to adopt a measured and methodical approach when selecting new machinery. Devoting time to consider their options will pay dividends, ensuring they choose the most appropriate system for their specific line requirements.

Producers should take advantage of the support available from product inspection experts to help them select the right system. Doing so will go a long way towards optimizing product safety and quality, avoiding the cost and reputational damage of product recalls, while also maximizing production line efficiency to protect their bottom line. ■

THIS ARTICLE IS BY DANIELA VERHAEG, MARKETING MANAGER AT METTLER TOLEDO SAFELINE X-RAY.

PET CONTAINERS

One-way Kegs Alter Beer Markets

Disposable PET kegs are an increasingly attractive alternative – they not only protect the quality of the beer, but also save costs of transporting empty containers back to the brewery.

In recent years, countries such as China and India have enjoyed rapid growth in the consumption of beer, making it one of the most popular drinks in the region. So much so that China is now the largest beer market in the world. In 2015, the Chinese drank almost twice (about 43 billion liters) the amount of beer as the Americans, who downed about 23 billion liters.

Over the past five years, the craft beer sector in China has grown over 250 percent, with over 1000 craft breweries now established in the country. Although the sector accounts for just 0.5 percent of the overall Chinese beer market today, the growth trend is set to continue and with it, the volume of beer produced by breweries.

Analysis suggests that demand for high-quality craft beer provided in draught format will account for 30 percent of the booming Chinese craft beer market by 2020. The move from bottles and cans comes as craft breweries build their brands, increase their volumes, and accommodate the changing taste of the Chinese beer-drinker. This is a trend that is likely to be replicated across other countries in the region.

The move towards draught presents new challenges for breweries who may have to start using kegs for the first time. They need to make sure they use a product which is easy to fill and handle at the brewery, preserves the quality of the beer, and is fully compatible with on-trade dispensing systems.

High costs of traditional packaging

Breweries moving towards draught packaging have to make investment decisions in terms of filling equipment, which can vary widely depending on volume, and also packaging type. The costs involved in a traditional stainless-steel keg pool can be high. While kegs – which are mostly distributed in areas close to the brewery – have a lifespan of 20 years or more, the impact of distribution over expanded domestic routes or export can reduce this to less than five years. The total cost of initial investment in the keg pool, the constant distribution of new kegs, and the cost of repairs can be significant. There is also the considerable cost of return transportation as well as those associated with managing and administering the keg pool.

Filling line

Eli Gershkovitch, owner of Canadian brewery Steamworks

Breweries also need to consider the current trend towards smaller containers of 20- and 30-liter sizes instead of the more traditional 50-liter containers, as the on-trade demands more choice for its beer-drinking customers. In this situation, the costs per liter for packing beer in metal kegs increase disproportionately.

Another problem facing many breweries is the loss of containers, often due to theft. Stainless steel is a valuable raw material and kegs often 'vanish' through external use, theft or acquisition by other breweries. An additional problem is that kegs used for export are often extensively damaged in circulation.

Expanding domestic markets

The complexities of transporting beer over long distances have led many breweries to explore alternative options. Disposable 20L and 30L PET kegs are an increasingly attractive alternative – they not only protect the taste and quality of the beer, but also help them overcome the challenges of long distances and save the cost of

Filling Petainer kegs

transporting empty containers back to the brewery. They can also be used on existing brewery filling lines designed for steel kegs, which means there is no additional investment required to switch to PET kegs.

Using disposable containers avoids return shipment costs, fuel costs and CO2 emissions because there are no return transport requirements. There are also fuel and CO2 savings in the original transportation from the brewery to final customer because PET kegs weigh less than their metal counterparts.

Glass presents a different set of problems for brewers. It is heavy, prone to breakages, and requires labeling for branding purposes. A single 20-liter PET keg replaces 54 beer bottles, providing a 70 percent reduction in freight costs and a 15 percent decrease in packaging costs.

Technical specifications of petainerKeg

Keg body:

- Lightweight monolayer construction
- Molded using PET
- FDA and EU food use approved materials
- UV protection
- Fully recyclable

Fitting:

- PP, POM construction
- Compatible MicroMatic flat-type fittings, A and G, systems and well-type fittings compatible of S and D systems
- Fully recyclable in normal plastic recycling infrastructure

Exporting to new markets

As the region's craft beer market matures, the successful brands will look to exporting their beer as a way of maintaining growth. This brings a new set of challenges.

Beer is usually exported overseas by ship – the most economical way. One major disadvantage in exporting, particularly over long distances, is the length of time it can take to reach destinations. Products are often in transit for six or more weeks. During this time, fluctuating and uncontrollable temperatures can have an impact on the quality of the beer. The beer is often exposed to warm temperatures, particularly when transporting from Europe to Asia and America or from North to South America. These temperatures can accelerate the chemical and physical reactions in the beer and make it age quickly.

Independent tests conducted by the VLB show that petainerKeg, with its integrated oxygen scavenger technology, has positive effects on flavor stability. On long journeys, when beer is exposed to relatively high temperatures, this can help to protect and preserve the original flavor. As well as preventing oxygen from entering the container, the scavenger also removes some of the oxygen that enters during the filling process.

When the beer arrives by ship, the sea containers are delivered to the customer or to other wholesalers. PET kegs weigh much less than metal kegs which makes them easier and safer to handle. Some markets have strict laws about how much workers can carry. For example, in Italy, there is a law prohibiting workers from carrying objects weighing more than 25kg at work. This means that even lighter metal kegs can pose a problem – using 20L disposable PET kegs is a practical and viable alternative for these markets.

When the beer reaches its destination, be it a pub, bar or restaurant, ease of handling is important as is space for stockpiling. Busy retail outlets are often short of storage, so the slim, taller shape of PET kegs is a real advantage. In addition, when a PET keg is empty, it can be disposed of for recycling of the material after releasing its pressure. This frees up storage space, which was previously needed for empty metal kegs until the wholesaler's next shipment.

Case study: lessons from abroad

Canadian brewery Steamworks chose petainerKeg to help it take advantage of emerging craft beer markets. Founded by lawyer Eli Gershkovitch in 1995 when he opened the Steamworks Brew Pub in Vancouver, Steamworks has gone from strength to strength as it has taken advantage of organic growth opportunities to increase the floor space at the original Gastown location, boosting seats from an initial 184 to 754 today, as well as adding another restaurant.

In November 2013, the most significant expansion for the brewery came with the opening of a full-scale brewery in November 2013. The 40,000-hectoliter capacity of the brewery dwarfs the brew pub's 2,000-hectoliter output.

With the brewery operating at full capacity, business has now achieved record growth with revenue up 50 percent per year or the past three years. Steamworks brews a number of award-winning beers, some of which are on their tap year-round and some that are seasonal.

Eli recognized very early on that there was an interest and curiosity in the Steamworks brand not just in the domestic market, but in the US and beyond. International growth was always an ambition and now Steamworks is now selling products in 14 US states, as well as overseas in Hong Kong, Germany, Austria, Italy and Switzerland.

Moving from operating a brew pub to a global business, Steamworks has had to tackle a new set of marketing, packaging and logistics challenges. This included exploring alternatives to traditional steel kegs which were too costly to use for exporting the beer. In 2014, Steamworks chose Petainer's innovative one-way PET kegs because they offer a much more practical, lower cost, yet high-quality alternative.

They also provide a range of valve options which are suitable for the different export markets Steamworks is focusing on, from Europe to Asia. Steamworks uses both the 20L & 30L petainerKeg with both D and A Type Valves. Petainer's local market presence through Petainer Canada also means that technical expertise and good service is readily available.

Over the next five to 10 years, Eli will continue to look at new opportunities to grow the business and build the brand, taking the Steamworks beers to new markets where they can be enjoyed. ■

THIS ARTICLE IS BY CHRIS MCEWAN, GROUP BUSINESS DEVELOPMENT DIRECTOR, PETAINER.

LABELS

Banish Label and Packaging Errors

This article shows the top reasons for product label and packaging errors and how manufacturers can protect their brands by automation systems in food manufacturing.

Product recalls can have a catastrophic impact on a food manufacturer's brand and business, and costs the industry millions of dollars a year. Many product recalls are related to labeling and packaging errors, which could have been detected and resolved at an earlier stage within the manufacturing process before products enter distribution. Not only would the manufacturer then have avoided a substantial fine, but they would also have avoided the significant damage to their brand reputation.

Labeling and packaging errors can cause cross contamination, premature spoiling, and consumer illness and fatalities, especially if the error lies within the allergen information. By preventing packaging errors, manufacturers can ensure a positive brand reputation, supply chain relationships and risk-free distribution, retailing and consumption of products within the food industry.

Why do packaging and label errors occur?

1. Human error

Retailers pushing for all category ranges to have a unified look has created difficulties operators who want to ensure the correct labels are applied to products. It is now commonplace for all products to have the same design with just one word different on the label artwork; hence it is very easy to select the wrong labels from a big box of labels, especially in a high speed, quick change over food factory environment.

Human error has the potential to cause a product recall in the case of a date code error. If the date code was incorrectly calculated or not changed during setup or changeover, and this was not identified before production, then this could cause the whole line to be recalled.

Many errors are made when setting up printers. It's all too easy to change the date and not the month or put the 32nd of a date. Although quality checks seek to prevent errors when signing off labels, these can be easily missed when you are trying to check 10 or more things, as well as keeping an eye on the production line.

2. Equipment errors

If a printer goes into a "fault" state, then this can usually lead to one of two things:

a. The printer stops printing but the line carries on running. This can result in unprinted or badly printed packs. If these are not detected by the operator at the end of the line, then these could go out to the customer.

b. The date code can revert to a default setting. This has been seen on a number of printers. If this change in date is not detected, then this will potentially result in a product withdrawal due to an inaccurate 'best before' or 'use by date'.

3. Promotional activities

In most cases, promotions are briefed to the production team at the last minute or packaging arrives just before production starts. This increases the pressure on the team and can lead to a lack of clarity around when the promotion was meant to start and finish. Incorrectly packing products into promotional packs after the promotion has ended can lead to retailer fines and claims for loss of income due to the wrong prices being scanned at the tills. This is very damaging for the manufacturer's brand reputation.

4. Supplier packaging errors

Packaging suppliers make errors too! Spliced reels of labels or films are more common than most people think. The difficulty with this, especially due to similar artwork designs, is that it is almost impossible for operators to spot mistakes on the line. Thirty-minute quality checks (applying a label to a check sheet and signing it off) may catch some, but if the splice error occurs between a check and in some cases reverts back to the correct label, the error will not be realized until the dreaded phone call from the retailer.

These errors from the suppliers can often go undetected or incorrectly identified as operator errors, which may lead to

misplaced disciplinary action. But without the necessary evidence, it is very hard to prove otherwise.

5. Last minute dot com...

The nature of the food industry means we have to respond to changes quickly, often at the last minute. Quick decisions and high production demands naturally lead to errors. Incorrect packaging being issued to the line, coupled with quick, inaccurate checks can lead to incorrect packaging being used.

Label and date code verification

Automation limits operator decision-making, creating an automatic, systematic and sustainable process controlled by minimal but essential senior management. Autocoding is the name typically given to software systems whose main objective is to prevent product recalls and protect brand reputation by ensuring the correct packaging and labeling have been applied to food products.

OAL first developed autocoding following an initiative between Geest PLC and Tesco PLC in 2001. The core principles have remained the same but functionality has been expanded to encompass quality assurance and factory performance modules through the Internet of Things (IoT).

The software links a master database of products, scanners, printers and touchscreen PCs on the production line. At this station, multiple product variations can be managed and automated at one time, allowing for streamlined product changeovers and planned stoppage times while ensuring minimal disruption to production. All the information is displayed in real-time on the human machine interface line screen, giving the logged-in operator full control and visibility.

Pre-production: Before the start of production, information for every product and job (for example, date codes, barcodes, packaging and labeling, etc.) is entered into the supervisory software, verified, and sent to the master database. When a product is approved on the master database, the job and product information along with the print file is sent to the touchscreen PC on the line ready for production.

Factories can program the autocoding system to request mandatory quality assurance checks before production can begin. These checks could include the scanning of tray end labels, entering of film trace codes, or capturing a photo of the packaging. It is another opportunity for the factory to take control and reduce the risk of errors such as the incorrect use of promotional packaging before production commences.

During production: Once the pre-production checks have been signed off and verified, production can then start. The Cognex scanner scans every 2D barcode that passes through its sensors. It then verifies the date codes, packaging and labeling using the job information downloaded from the database.

If an item passes through the scanner and the data collected does not match the data received from the job download, the alarm is automatically raised and the line stops. A higher level of authorization will then have to carry out the specific procedure for that factory to ensure the fault is identified and resolved to avoid continuous errors.

If the Cognex scanner is set up correctly for the product on the line, it offers a consistent and reliable read rate so defective products cannot pass through undetected. Before production can restart, the system, if programmed to do so, may ask operators to carry out additional QA checks for an extra level of verification and security. The system can also be set up to prompt QA checks on a timed basis throughout production to check nothing has changed down the line and to ensure equipment is working to full capacity (helping to avoid equipment errors).

Why use identity and not vision?

Identity scanners provide greater accuracy than vision-based systems because they verify an exact barcode. Using a scanner that relies on vision does not produce 100% accurate results, as the image only has to have 'most' elements in common with the master image it is being compared to for verification. Identity relies on the scanners reading and comparing the information, and only verifying if it is a perfect match. This ensures an accurate and reliable system for you and your retailer's peace of mind.

Can you scan any packaging?

By changing the configuration of scanners on the packaging line, any packaging format can be scanned giving factories the flexibility needed. Over the years, OAL autocoding has been used to scan many packaging formats including flow wrappers; baggers; top and base labels; c wraps; sleeve and boxes; pots; tins and jars.

2D version control and artwork

2D coding and scanning allows food manufacturers to scan products without a barcode so all areas of packaging are traceable. Unlike 1D barcodes, 2D barcodes provide control over the version of packaging. As the 2D barcode is not under the control of the retailer, it can be adjusted when there are any minor changes to the packaging to ensure that old packaging is not used. 2D barcodes

will affect artwork and involve an extra 2D barcode being printed on packaging.

A touchscreen terminal on a production line creates fantastic opportunities for food manufacturers to get their systems connected and embrace the IoT. The touchscreen can run label and date code verification software as a standalone application or be expanded to include modules for food safety, traceability, performance, productivity, recipe management and much more. These all help you get the most out of your factory.

Traceability

Trace and integrate all relevant data from raw material intake, in-process and packing, finished goods, dispatch and customer information to guarantee an efficient response to internal and external quality issues and maximize rapid response capabilities. Full, verifiable traceability and compliance to retail audits are two of the key benefits.

Paperless shop floor

By embracing IoT, factories can go paperless, ensuring accurate real-time data for the functions mentioned, e.g. food safety. All data is easy to retrieve, store and utilize; eliminating the risk of discrepancies and significantly reduces the risk of data and valuable information being lost or spoilt.

A factory auditor can retrieve all the information they need easily and efficiently with higher level of assurances than paper-based systems. A paperless system holds individual operators accountable for all their decisions; senior staff can clearly see who was operating the machine at any given moment.

Factory performance and productivity

Management and operators can make informed decisions with real-time data from across the food production area. Live data can be pulled from connected devices, analysed, and fed back to teams to make decisions on the go to reduce downtime.

Manage giveaway with checkweigher links

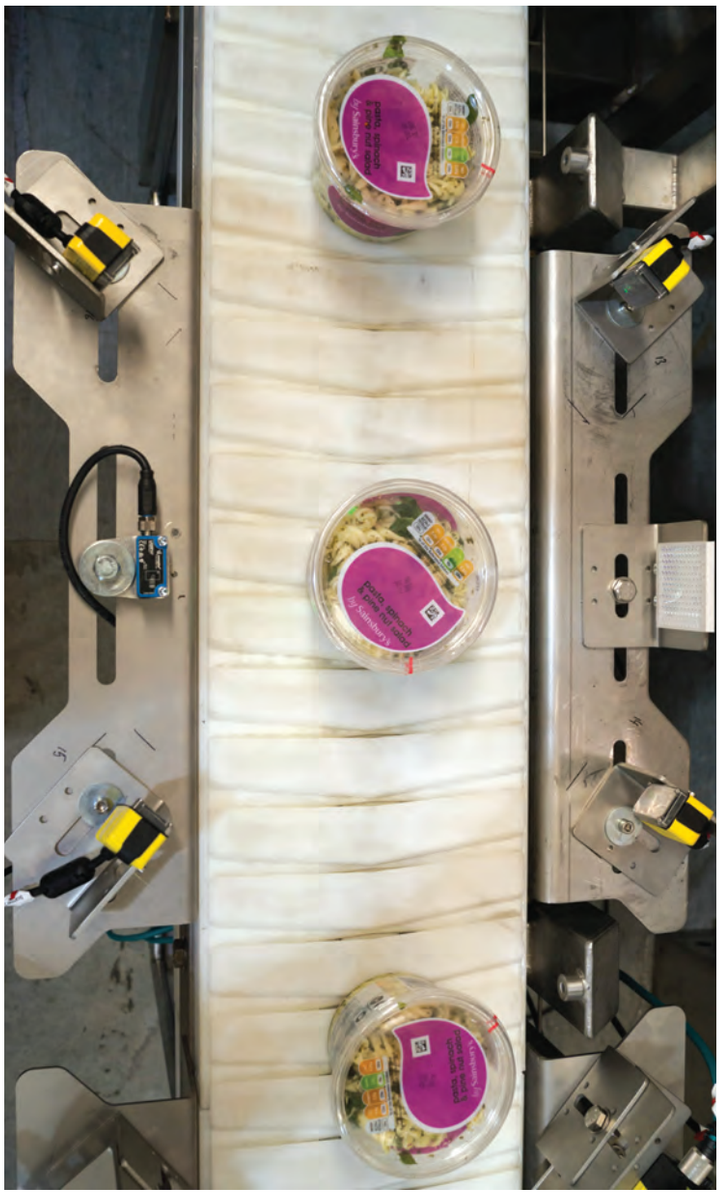
For products sold at a fixed weight, live checkweigher data can be acted upon to minimize giveaway. OAL have a strong track record for integrating all types of checkweighers used within food manufacturing, helping manufacturers to save money and increase yield.

As soon as an error occurs and it affects external stakeholders, the brand faces a level of damage to reputation and image. OAL's autocoding system can contribute to reducing the risk of errors due to incorrect label and packaging. This accurate, real-time system provides a factory with a robust process to avoid product recalls due to label and packaging errors. This high level of guarantee could be key to having a competitive advantage within the market and/or could help build a positive relationship with the supply and distribution chain based on trust and reliability.

The vision for the future

Annually, OAL and the University of Lincoln host the Food Manufacturing 2030 conference, where retailers and food manufacturers discuss future technologies and developments. The following are areas particularly relevant to the packaging line:

Smart labels: Smart labels identify and signal to the consumer when the food is spoilt and cannot be consumed. For instance, Bump Mark uses gelatine to let consumers check by touch. So, when it is smooth, your food is fresh; if you feel bumps, then it is time for the bin. The label is timed to go 'bad' as the food spoils. It will be important to control the application of smart labels to ensure they aren't applied to the incorrect products, an area which the OAL Autocoding system can assist.



Why use identity and not vision? Identity scanners provide greater accuracy than vision-based systems because they verify an exact barcode. Using a scanner that relies on vision does not produce 100% accurate results, as the image only has to have 'most' elements in common with the master image it is being compared to for verification.

Digital flexible printing: Digital flexible printing will let manufacturers add individual information and decoration to a batch down to a single unit printed onto a top film, before it is sealed to a tray. Flexible printing is a key enabler for mass customization and will change the way packs are labeled. The printers, however, will still require control from a system like OAL Autocoding. ■

THIS ARTICLE IS BY WAYNE JOHNSON, AUTOCODING PRODUCT MANAGER, OAL.

FORTIFICATION

Diabetes: What More Can Do?

While government initiatives are part of the solution, the growing number of food products marketed to diabetics shows the role of the food industry in helping to prevent the disease.

Diabetes is one of the largest health emergencies of the 21st century, with 78.3 million people in Southeast Asia reported to be suffering from the disease in 2015. In Asia, the number of people with diabetes continues to increase at unprecedented rates, and it is estimated that one in 10 adults globally will be affected by the condition by 2030. According to the International Diabetes Federation (IDF), these are figures that have become a serious concern for many countries and governments in Asia; in Singapore, the Minister of Health has recently declared a 'war on diabetes' and outlined a strategy to tackle the growing problem.

Reducing the risk

Thankfully, the most prevalent form of diabetes – type 2 – is also the form that is preventable, or in many cases reversible, as it is heavily linked to lifestyle factors such as physical inactivity, poor nutrition, and diets that are high in fat, sugar, and refined carbohydrates. Early detection of prediabetics – that is, those who have blood glucose levels that are higher than average but not high enough for a type 2 diabetes diagnosis – will play an important role in preventing the further spread of this disease.

Insights into Asia

Research specific to Asia is critical in preventing and managing diabetes across the region. For example, it has been found that Asians have a unique phenotype that makes them particularly susceptible to obesity and type 2 diabetes. Coupled with traditionally carbohydrate-rich diets, which include hearty servings of rice and noodles, this helps explain why individuals in this area are especially at risk. Such findings are key in aiding an understanding of the disease and opening up opportunities to develop more effective solutions, such as encouraging the consumption of lower GI rice varieties.

Can better nutrition help manage diabetes?

While official initiatives are part of the solution, the increase in the number of food products marketed specifically to diabetics over the past decade – particularly in India – shows the role the food industry can play in helping to prevent and manage the disease. Indeed, this will only grow as consumers become more aware of the condition as a major health issue.

Nutritional management of type 2 diabetes is very important and both macro- and micro-nutrient intake needs to be carefully adjusted to ensure a fine balance is achieved. Diets for those with diabetes should promote weight loss by including less fat and sugar, while ensuring they do not inadvertently lead to micronutrient deficiencies. One way to avoid this is to have a daily intake of a multi-vitamin preparation. This could contain vitamin C, for example, to improve vascular function and decrease oxidative and inflammatory stress, or vitamin E, which may reduce cardiovascular risk in genetically susceptible individuals with diabetes.

As well as reducing fat and refined carbohydrates, reducing sugar represents one way to help manage diabetes. However, it may be difficult in certain applications such as dairy to cut added sugar while also meeting taste and texture targets. For manufacturers, such technical challenges can be overcome by using lactase enzymes, which break down lactose into more easily digested and sweeter forms of sugar: glucose and galactose. These components have a higher relative sweetness compared to lactose and create a profile which is very similar to sucrose, allowing for the preferred taste to be achieved with less or no added sugar.

Apart from reducing sugar to help diabetic consumers, there are also opportunities for manufacturers to fortify their food items with scientifically-substantiated nutritional ingredients such as oat beta-glucan, which is proven to improve glucose control in both healthy and diabetic individuals. The EU commission has already authorized a cause and effect relationship between the consumption of beta-glucans from oats and a reduction of post-prandial glycemic responses.

Improved nutrient labeling can aid prevention

The food industry is also implementing new ways to help support both diabetic and non-diabetic consumers in choosing healthier food. Traditionally, many product labels show levels of calories, fats, sugar and salt. However, they do not take nutrients into account. Thankfully, regulators are beginning to engage with the concept of nutrient-energy density – that is, the amount of nutrients per gram of food, in comparison to the calories it contains. Labeling that includes this information helps consumers in choosing diets that are not just high in fats and carbohydrates, so reducing the likelihood of both obesity and type 2 diabetes.

In Singapore, for example, the Healthier Choice Symbol (HCS) guides purchases in a way that incorporates healthier options into the diet. Products with the symbol are generally lower in fat, saturated fat, sodium and sugar, and higher in dietary fiber, calcium

and wholegrains. To make nutrition labeling more comprehensive, the Health Promotion Board has recently introduced enhanced versions of the HCS, each of which focuses on a specific nutritional aspect of the product.

In the Philippines, on the other hand, the Sangkap Pinoy Seal Program (SPSP) encourages food manufacturers to fortify processed foods or food products with low levels of naturally-occurring essential nutrients. Consumers recognize the SPSP logo and use it as guidance to select nutritious and fortified foods. India has also recently introduced a 'fortified' logo, which will appear on the packaging of staple products to show which have been fortified with added vitamins and minerals.

Opportunity is ripe

Diabetes is a serious issue in Asia-Pacific, and the spotlight is increasingly being shone on the food industry to step up and be an active partner in fighting this disease. For manufacturers, this means providing more nourishing products – as opposed to those which contribute to rising obesity levels. Fortification has been shown to be one of the safest and most cost-effective measures to improve the nutritional value of a diet, with the potential to rapidly improve the micronutrient status of the population without any changes in existing food patterns or in individual compliance.

Now, there are also innovation opportunities for the food industry to create products specifically for diabetic consumers, such as lower GI options for common foods like rice and noodles. A new paper published in the European Review for Medical and Pharmacological Sciences suggested that high doses of vitamin D and omega-3 fatty acids may play a role in preventing the progression of type 1 diabetes. Research of this kind presents a way for food manufacturers to develop products that can support consumers in choosing appealing and affordable diets, with nutritional solutions for the prevention and management of diabetes. ■

THIS ARTICLE IS WRITTEN BY DR. FEMKE HANNES, NUTRITIONAL SCIENCE ADVOCACY MANAGER, DSM.

SWEETENERS

High-intensity Sweeteners in Asia

The global HIS market is forecast to grow at a CAGR of over 4 percent between 2017 and 2021, with demand in China to grow at a higher rate of 5 percent for the same period.

Consumer clamor for sugar reduction has been on the rise. This attitude is fueled by other trends such as natural, clean label, health and wellness, and obesity. Reducing sugar, calorie intake and finding natural alternatives have been priorities for food ingredient companies who aim to align their new product development (NPD) activities with these consumer trends.

High-intensity sweeteners (HIS), due to their nature of intense sweetness, are added in miniscule quantities in food and beverage products. This means that they contribute only a few calories or no calories, depending on how they are metabolized. These sweeteners, which are reasonably robust sugar substitutes, are accepted by consumers for reasons such as weight-loss support function due to reduction of calorie intake, keeping blood sugar level low, preventing tooth damage, etc. This enables food and beverage manufacturers to make 'sugar-free' or 'diet' health claims on their products.

The commonly known high-intensity sweeteners are: saccharin, aspartame, acesulfame potassium (Ace-K), sucralose, cyclamate, alitame, neotame, thaumatin, neohesperidine dihydro chalcone (NHDC), advantame, steviol glycosides, and luo han guo fruit extracts.

Figure 1 represents the classification of high intensity sweeteners by occurrence.

Based on their nature of calorie addition in the product, HIS is categorized as nutritive (e.g., aspartame) and non-nutritive (e.g., saccharin, ace-K, others) sweeteners. Further, HIS can be divided into two groups – artificial or chemically synthesized sweeteners, and natural sweeteners extracted from plant sources (e.g. extracts from stevia rebaudiana, luo han guo or monk fruit, and glycyrrhizin from licorice root). Currently, it is the natural high-intensity sweeteners that are under the consumer spotlight due to their positioning as a safe and healthy alternative. Food scientists and innovators are researching to find ways to switch from chemical ingredients to healthier natural alternatives. At the same time, the focus is on maintaining a perfect balance between the sweet taste and health, since consumer reaction to taste will remain the most important parameter in any product development initiative.

There are many challenges during reformulation of sugar and calories in the end-use products, especially the inherent flavor issues associated with high-intensity sweeteners. The most common issues are a delay in the onset of the perceived sweetness, a lingering sweetness, bitter aftertaste, metallic aftertaste, and a lack of mouthfeel.

To overcome these issues, food ingredients companies are investing significant sums of money in the research and

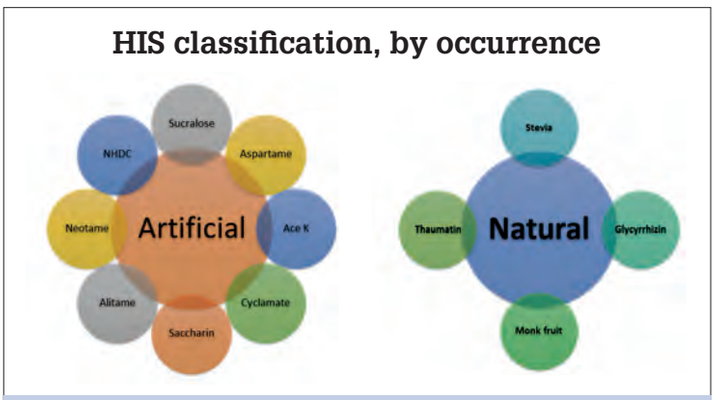
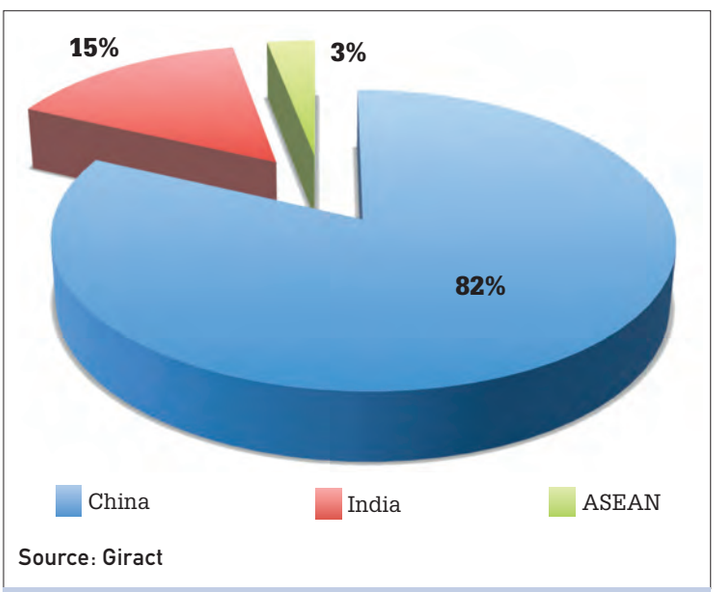


Figure 1: HIS classification, by occurrence.



Source: Giract

Figure 2: Asia's demand for HIS, by country , in 2016

development of viable new high-intensity sweeteners and improving the performance of existing ones to match the required parameters in end-use products. When a product touches a consumer's tongue, the brain should feel comfortable with the taste. However, taste is not the end of the road for challenges in developing a commercial product, but rather just the starting point. The factors to be considered for a successful commercial product includes the overall consumer demand, acceptance over the current products, government policies, and so on.

While the scenario is almost common across the globe, there are a few additional interesting factors that exist in specific geographic regions based on their demographic nature.

Asian scenario

Due to the increase in prevalence of lifestyle-related health problems such as obesity, hypertension, dental damage and diabetes, reduction and restriction in sugar consumption has become more imperative in Asia, particularly in China and India. To address these issues, the governments in Asian countries such as the Philippines, Indonesia and India are proposing to implement and incorporate taxes related to sugar levels in the form of soda tax, sugary drink tax, etc. Government initiatives to sensitize the population and the intense advertising by the food manufacturers about calories and nutrition has led to the trends such as sugar reduction, no or low calories, and no added sugar claims. These trends in turn led to the increased demand for food products with sugar substitutes or alternatives, and opened the door for high-intensity sweeteners in the Asian market.

China

China is the largest producer and exporter of HIS in Asia, as well as in the global market. It is also the largest consumer. The following HIS are approved to be used as food additives in end-use products at specific dosage levels: saccharin, aspartame, Ace-K, sucralose, neotame, cyclamate, stevia, thaumatin and alitame.

Among all the HIS, the volume of cyclamate produced is almost 50 percent of the total volume of HIS produced in China. HIS such as NHDC and monk fruit extract are produced in very small quantities and are not listed under the permitted sweeteners category in the document published by National Standard of Food Security, People's Republic of China.

The major demand for HIS in the country comes from the beverages sector, and this demand is anticipated to grow at a rate of around 5 percent until 2021. The confectionary sector and non-food sectors are anticipated to witness a strong growth among other end-use sectors and will have a considerable impact on the demand for HIS.

With respect to individual HIS usage, cyclamate is the most commonly used HIS, followed by aspartame and ace-K. Saccharin is predominantly used in non-food applications such as pharmaceuticals products, oral care products and pet food, while stevia finds its major usage in the beverage sector and sucralose in beverage and confectionary sectors.

Major demand for HIS in China and India come from the beverage sector.

While the global high-intensity sweeteners market is forecast to grow at a CAGR of over 4 percent between 2017 and 2021, the demand in China is anticipated to grow at a higher rate of 5 percent for the same period. In value terms, cyclamate has the largest market share, followed by sucralose, aspartame, ace-K, alitame, and others.

Figure 2 represents Giract's estimation of demand for high intensity sweeteners in Asia, by country in 2016.

India

India is the second most populous country in the world and is one of the fastest growing economies. The Indian food industry is poised for a huge growth and has emerged as a high profit sector due to its immense potential for value addition.

In India, sucralose, aspartame, ace-K, saccharin, stevia and neotame are the high-intensity sweeteners approved by the food regulation body FSSAI to be used in the end-use sectors as per the guidelines. On the supply scenario, apart from saccharin and sucralose, there is not much production observed in the country and majority of the demand is met through imports.

Currently, the major demand for HIS comes from the beverages sector growing at 7 percent, followed by the non-food, other food and confectionary sectors. The overall demand is anticipated to grow at over 8 percent until 2021.

Saccharin is the most commonly used sweetener among all the approved HIS in the country, followed by aspartame and sucralose. While saccharin is mainly consumed by the beverages sector, aspartame finds its application in the beverage and confectionary sectors.

Though the current volume of HIS consumption is low compared to China, the Indian market demand for HIS is anticipated to grow rapidly at the rate of around 8 percent, which is higher than other regions across the world until 2021. Similar to volume, saccharin leads the market in terms of value in the domestic market, followed by sucralose, aspartame, neotame and ace-K.

Conclusion

Our love towards sweet taste will not cease because it is an evolutionary prerogative. For food innovators and scientists who are focused on innovation in sugar/calorie reduction, the various high-intensity sweeteners provide a comprehensive toolbox. The market is particularly driven by the potential for HIS to address the growing population with obesity, diabetes and other health complications because of increased sugar consumption.

Due to concerted efforts by research and development scientists, the world has already started to taste the initial success stories with natural high-intensity sweeteners such as those from stevia, monk fruit, etc. Innovative developments won't stop with these options because there are many natural raw materials available across the world which have great potential for finding novel natural sweeteners (e.g., monellin, brazzein, pentadin, mabinlin, miraculin, neoculin).

To explore and stay competitive in the world of sweeteners, ingredient manufacturers need to further invest in R&D to develop more standardized, functionally dominant HIS with a good taste profile.

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PROBIOTICS

Choosing the Right Probiotic Ingredient

This article will guide you through the steps needed for probiotic fortification and show the basics of what to consider when evaluating the right probiotic ingredient for a successful product.

Innovation in probiotic research, technology and ingredient offerings means that it is easier than ever before to create safe and effective food and beverage products with mass consumer appeal. Ready to formulate a probiotic product? As with any functional ingredient, determining which probiotic is best for your product deserves time and attention. Here, we will guide you through the steps needed for probiotic fortification, and you will learn the basics of what to consider when evaluating the right probiotic ingredient for a successful product.

Michael Bush

Choosing a probiotic strain

As the probiotic industry expands globally and continues to experience strong growth in the food and beverage category, it is important to understand the unique strains available in the marketplace today. Clearly, probiotic strains each possess distinct characteristics, along with application and health advantages specific to each strain.

So which strain is the best for a new probiotic product? The following information can help differentiate the unique qualities among common probiotics:

First, it is important to understand the most common probiotic types. There are three genera of bacteria that comprise the majority of bacteria with recognized probiotic activity: Lactobacillus, Bifidobacteria, and Bacillus.

Lactobacillus and Bifidobacteria

These are vegetative bacteria, which mean their cells are not particularly resistant to high heat or desiccation, and tend to be sensitive to extremes of acid and alkaline conditions as found in stomach acid or small bowel. These are often found in fermented milk products. Because these bacteria are fragile, they require refrigeration to remain viable. Strains of Lactobacillus and Bifidobacterium are supplied in their living, vegetative states. That is, they are living organisms that require very specific environments to remain viable. These typically cannot be used in products that are shelf-stable, frozen, heated or subjected to extreme manufacturing processes.

Bacillus

These are hardy, spore-forming bacteria that act as vegetative bacteria when conditions are optimal for their growth, but can form dormant spores when conditions are detrimental to their viability. This spore can be equated to a plant seed – it is dormant and won't grow until there is the right temperature, moisture and environment. The Bacillus spore structure protects it from heat and cold until it reaches that environment. These spores are much more resistant to extremes of pH, heat, cold and pressure than vegetative cells, making them a much better fit for fortification in everyday foods and beverages. These bacteria can be used in products that are hot, cold and frozen, shelf-stable or subject to extreme manufacturing processes.

If you want to formulate a shelf-stable, heat-resistant product, then opt for something in the Bacillus genera. In this category, Bacillus coagulans and Bacillus subtilis are the prime genus and species.

As within the Lactobacillus and Bifidobacteria genera, some Bacillus strains may be considered probiotics, but many are not. Without clinical trial evidence, it is not possible to say which are truly probiotic. Therefore, it is crucial to choose a Bacillus strain backed by research for safety and specific health benefits.

It is also important to keep in mind that safety and efficacy varies widely at the species level. For example, Bacillus coagulans GBI-30, 6086, branded as GanedenBC30, has long-term safety data

At the end of the day, perhaps nothing is more important about an ingredient than its safety.

and 27 peer reviewed, published papers on its health benefits. No other strain has the same attributes as this particular strain, and therefore the safety and efficacy data from one strain does not apply to others – even within the same genus and species.

Health benefits and claims

Because specific probiotic strains offer specific benefits, it is important to be very selective about the probiotic ingredient being used. It is crucial that the chosen ingredient has research to support the specific health benefits it purports to have. While products sold in Asian countries may not be able to use all health claims made in the US on packaging and in marketing material, the data supporting claims associated with GanedenBC30 will provide confidence in the efficacy of the probiotic ingredient.

Following are some health claims supported by clinical data relating to GanedenBC30 in the US.

- Probiotic
- Supports digestive health
- Support immune health
- Survives 10X more effectively than yogurt cultures
- Enhances protein utilization

Safety

At the end of the day, perhaps nothing is more important about an ingredient than its safety. The safety (and efficacy) of a probiotic varies from strain to strain, so be sure that the probiotic you are considering has been determined as safe. The safety testing should also have been reviewed by qualified experts to provide further confirmation that it is safe for healthy individuals to consume. For US-manufactured probiotics, you want to ensure the ingredient has received US Food and Drug Administration's (FDA) Generally Recognized As Safe (GRAS) status. This means that after an expert panel's lengthy review of the ingredient the FDA's Department of Health and Human Services has no questions or objections to its safety research. This assures that the company has adequate safety on the specific ingredient.

Here are five questions that every manufacturer should consider when choosing which probiotic ingredient to add to a SKU:

1. Is there published data supporting health benefits for the particular probiotic strain? And are the supported benefits in line with your food and beverage product? For example, does the research on a strain demonstrate benefits in children while your product is aimed at the active senior market? Make sure there is valid data and it is a good fit with the functional benefits and health offerings you want in your product.

2. Has a GRAS letter of No Objection from the US FDA been issued for the particular strain? Safety first, so why pick a strain that has not undergone the appropriate level of scrutiny regarding its safety for your given application?

3. Is this probiotic strain widely recognized in the marketplace in its country of origin? You are looking to add value to your product line, so opt for a strain that is widely distributed and well branded with proven success.

4. Will consumers pay extra for a probiotic product for this particular product? Cash is tight and everyone is looking for value. By adding a quality probiotic to your product, you add value, and consumers will pay for value. But make sure that your product is one where consumers will see added probiotics as a bonus — and that the ingredient supplier you are working with has consumer data to back it.

5. Does the ingredient supplier have a validated method to test each strain for inclusion, viability and shelf life guarantees? Ganeden works with each of its partners to do personalized product testing, and ensure survivability and efficacy at the time of consumption.

Formulation to shelf support

Once efficacy and safety are confirmed, it is important to also consider the support offered by the company that manufactures the ingredient. You want to ensure that the supplier will work with you through the entire formulation process, and even support your marketing efforts.

Think of your probiotic ingredient manufacturer as a business partner. You want to work with a company that has a vested interest in your success. This means their experts will work with you to create the ideal probiotic product. They should readily send you product samples, and work with you to determine inclusion rates. The ingredient supplier should also help you test your product to ensure that the probiotic is available at efficacious doses at time of consumption.

Ask prospective ingredient suppliers what their post-production support will be. For example, can you use their ingredient's trademark on your package? Will they promote your product in the press, including press releases, social media, etc.?

Clearly, determining the right probiotic ingredient for your product, or products, is a multi-step process. While the efficacy and safety of the ingredient is vital, so is the reputation and support offered by the company that makes it. Choosing your probiotic should not be a rushed process; take your time to review the science and get to know the supplier. Your diligence in this process will ensure your probiotic food or beverage is poised for success. ■

THIS ARTICLE IS BY MICHAEL BUSH, PRESIDENT AND CEO OF GANEDEN.

SMART MANUFACTURING

Transforming F&B with IoT

Manufacturers in Asia-Pacific are already collecting and using data generated by smart devices to enhance manufacturing and operating processes.

While some industries may have only started gaining greater awareness of the Internet of Things (IoT) in recent years, food and beverage (F&B) manufacturers have been applying the concept for decades, specifically in relation to monitoring, measuring, and responding to manufacturing metrics throughout the plant – key to quality control.

Over the years, F&B technologies and tools on the manufacturing floors have continued to evolve – for instance, standalone circular chart recorders and low-temperature alarms have been replaced with centralized control centers that monitor and manage a complex food plant across the entire supply chain, from procurement to processing to packing and, ultimately, even storage and shipping. But IoT goes beyond just delivering more efficient quality control for F&B companies. It has the potential to transform an entire business.

As food companies reassess their readiness for meeting regulations, such as Singapore's Food Safety Management System (FSMS), a key factor is collaboration with their vendors, partners, employees, and customers. F&B companies need to be able to demonstrate reliable and preventative procedures that can manage both incoming and other metrics throughout the supply chain. Traceability is more than knowing where a product came from and where it went, but also the parameters by which it was transported and stored.

Therefore, while IoT has already started to impact many aspects of manufacturing, supply chain management and logistics, it promises the greatest potential for the future. Scanners, barcodes, and GPS tracking devices are already being used to monitor the movement of goods in the warehouse and on trucks to customers. Manufacturers in Asia-Pacific are already collecting and using data generated by smart devices to enhance manufacturing and operating processes.

At the heart of IoT is its ability to provide accurate and useful insight needed to drive greater value and efficiency within the tight margins in which many food companies operate. For example, having better visibility and quality of incoming, short shelf life ingredients, and balancing this with real-time visibility of demand and historical data, allows for better planning and scheduling, if you also have the forecasting tools that can quickly analyze all these data points. But this is possible only when sensors from connected devices, tools, and machines are able to effectively collect relevant data, and communicate with each other seamlessly. Minimizing downtime and improving the fulfillment accuracy of orders can have a profound impact on an F&B company's bottom line.

The power of IoT to help improve profitability goes beyond production planning and scheduling. For instance, it can include a maintenance technician who's checking the inventory of a spare part remotely while repairing a critical piece of equipment, or a warehouse manager using a tablet to confirm the location of forklifts and personnel.

The continued adoption of mobility is also changing the core requirements of IoT. Manufacturing leaders can't be chained to their offices, desk and PCs. To be effective, they must walk the plant floor. They make decisions onsite, in the heart of the operation. They need 24/7 access to critical data and systems from remote locations.

While the technology has improved and the cost of collecting and analyzing data in a manufacturing plant, and beyond, has decreased, the data is often underutilized. The true value of IoT can only be achieved by eliminating silos and getting disparate systems connected and communicating with one another efficiently. Data is meaningless if it is stored in silos and if it lacks the full dimension of context. What matters is how important the data is, and what you do with it. With real-time access available to easily monitor the details of the complete manufacturing operation – within the four walls and beyond – a company can begin to see real value. Interoperability is key; it is more than simple integration. Data must be able to be consumed in context and used for event triggers and actions.

Insights derived from data analysis can also help F&B manufacturers focus on markets, buying trends and customer attributes, as well as details about the product in use in the market, and consumer opinions. On the social front, manufacturers need to take advantage of integrated tools to capture conversations and use those to build a knowledge base and document key decisions relating to product design and customer orders. The need to be able to quickly respond is one of the reasons that more F&B companies are looking to move more of their core IT solutions to the cloud. Flexibility, speed of deployment, and improved security are all fundamental requirements to be able to embrace the value of IoT.

The challenge for F&B companies lies not in defining one IoT vision, but understanding where the biggest opportunities are. Every company has different needs and potential for improvements, so the requirement is to define a roadmap on how to turn their data into meaningful actions. The goal is not to collect as much data as possible, but in setting a data strategy that can have the greatest positive impact on a company's future. ■

THIS ARTICLE IS BY HELEN MASTERS, VICE PRESIDENT AND MANAGING DIRECTOR, SOUTH ASIA – ANZ & AZEAN, INFOR.

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