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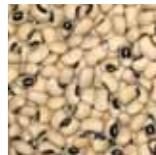
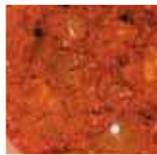
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Insulated sectional overhead doors are manufactured to suit individual openings for all types of commercial and industrial buildings where the need for energy conservation is desired. Most commonly used for warehouses, commercial buildings, industries, logistical applications, etc.

What is an overhead door?

Overhead doors are made of several jointed panels that roll up on tracks above the access or across the ceiling. These doors come with different rail systems depending on the building and the space available. The tracks can either go straight up above the doorway, with a bend towards the ceiling or they can follow the roof pitch. The overhead door is primarily used as a service door but also very popular as garage door.

Sectional door

The overhead door currently is the bestselling door on the market. It is known by different names such as sectional door, section door or garage door.

History of the overhead door

In the late 70s and early 80s of the last century overhead doors were introduced as an alternative to non-insulated rolling shutters. Because they consist of insulated sandwich panels overhead doors have excellent insulating qualities. Another advantage was the ability to fill the doorframe with glass panels and the installation of a wicket door. Furthermore, overhead doors are very stable and suitable for relatively large door sizes.

The Compact door as an alternative service door

The Compact door can be regarded as an overhead door, because the door panels are stored 'overhead' when the door is open. From the outside it even looks like another overhead door, but all the difference is made on the inside. The main advantage is that the Compact door is a folding door. This means that it saves a lot of space.

Due to the universal rail system a Compact door always fits and doesn't require complex structures. Architects have a lot more freedom in design this way and the saved space can be used for other important things. The Compact door doesn't have maintenance prone counterbalance springs. Moreover, the engine is installed on the self-supporting system of the door so it does not require structural adjustments.



Advantages of the Compact door

Depending on the situation there are many advantages in the use of a Compact door to the sectional door. In buildings where crane tracks are used, for example. Compact doors do not block the daylight coming through skylights or windows above the doorway. The extra space above the doorway can be used as storage space. Or for the extra height that is needed for a car lifting platform right behind the door. Or a sprinkler system, a heater over the door or piping and tubes. The possibilities are virtually endless.

Rather than rolling or sliding like conventional doors, the Overhead Stacking Door stacks at the top of the opening. This gives a huge benefit in terms of headroom requirements over a traditional sectional door and still provides excellent levels of insulation. The door also provides good security due to an automatic anti-lift locking system. It is a quiet and low maintenance door, requiring minimal structural support.

Overhead Stacking Door offer superior resistance to all weather conditions; along with offering security and excellent insulation. These qualities, combined with simple and efficient operation makes them a popular choice for external doorways on temperature-controlled buildings.

An overhead door having a plurality of unconnected panels. Each panel has a top and bottom edge interlocking retention geometry and end caps. The end caps engage dual track guide assemblies to completely separate the panels as the door is raised.

Sectional doors have the advantage of having no areas of cold bridging to satisfy Building Regulations for new buildings. Also available are insulated vision windows or architectural glazed and aluminum panels which are a popular choice for vehicle

workshops, allowing plenty of daylight into the working area.

The doors have motorized operation with a variety of control methods. The doors can also be fitted with integral personnel doors to facilitate pedestrian traffic with minimal energy loss.

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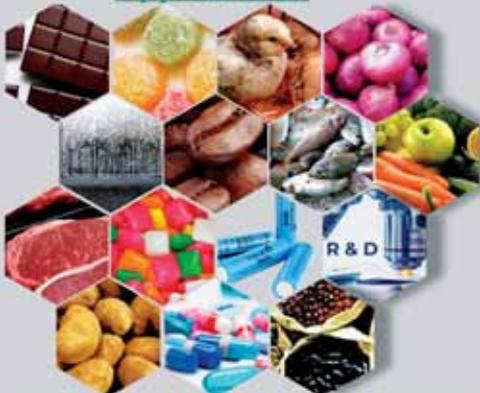


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Sustainability is an investment worth making in 2020!

Almost everyday, it looks like there is a new headline about the exaggerating problem of plastic waste. Environmental sustainability and business don't always go hand in hand, particularly when it comes to product packaging.

Most, if not all, companies are planning to go green with their packaging techniques and methods. Helping the environment is basically one benefit of using eco-friendly packaging but the reality is that using eco-friendly packaging products requires fewer materials. This is even more sustainable and also yields better outcomes.

And if you are like a lot of forward-thinking companies, you must have set corporate sustainability goals that your entire organization is endeavouring to accomplish. Sustainability continues to be a global movement in the packaging business as consumers constantly seek out healthier food options and manufacturers whose novel packaging and processes optimistically impact the environment and the value of their goods.

As the demand for clean-label ingredients continues to rise and consumers becoming more health-conscious, the food industry is competing to come up with innovative technologies to make food safe from decay for longer time frames without compromising the quality or flavour of that food.

Sustainable packaging aims to address food waste and loss reduction by safeguarding food quality, as well as food safety issues by preventing food-borne diseases and food chemical contamination. Furthermore, it must address the long-term imperative issue of environmentally persistent plastic waste accumulation as well as the saving of oil and food material resources.

Green packaging uses environmentally sensitive approaches as a huge amount of energy is used up in the production of traditional packaging materials like cardboard, plastic, and paper. Generally, the source of the energy is fossil fuels that add up millions of tons of carbon dioxide and methane into the atmosphere while the waste packaging material ends up in water bodies or landfills.

The green movement has led to a surge of inventive new eco-friendly substitutions to traditional packaging materials. From biodegradable containers to recyclable plastics, there is apparently no end to the options available to the environmentally conscious business.

Traditionally the main purpose of food packaging has been to guard its contents, and to safeguard the food is safe to eat. Now the aim is also to ease the amount of packaging – and plastic in particular – while still upholding the integrity of the pack and quality of the food.

Companies must consider the environmental, social and economic consequences of their packaging to intensify market share. For example, using inks made from foods or milk proteins rather than harsh chemicals, or bioplastics, plant-based packing peanuts, and rainforest-friendly paper are just a few ways you can help the environment with your packaging choices. Give it a thought...

Linda Brady Hawke

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Contents

February 2020

Ingredients

- 20 An Uptick in Salt Content Reduction Ingredients
- 22 Dietary Fibers in Sports Nutrition
- 26 Analytical Accuracy of Fat-Soluble Vitamins with Agilent Technologies
- 27 Flavor Encapsulation in Food and Beverages



Processing

- 30 6 Examples How Product Recovery Can Mean Profit Recovery
- 33 Creating Added Value with X-Ray Technology
- 36 New Automatic Defect Removal for Potato Strips



Market Research

- 38 Authentication Solutions pertaining to the Food Industry

Packaging



- 48 Less Plastic, More Communication: New Concept for Modified Atmosphere Packaging
- 50 Thinner is more Sustainable – Foodstuff Packaging gets Lighter and Lighter
- 52 Aseptic Packaging





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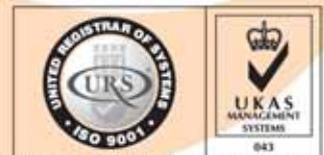
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FSSAI WORKING TO IMPROVE HYGIENE AT FISH & MEAT MKTS

In view of the deadly coronavirus disease originating from a meat market at Wuhan in China, India's food regulator FSSAI on Monday said it has stepped up efforts to improve hygiene and sanitation in the country's meat and fish markets. Expressing concern over poor hygiene in the meat and fish sector, Food and Safety Standards Authority of India (FSSAI) CEO Pawan Agarwal said it has been auditing slaughter houses for the last six months. The audit of government slaughter houses has been completed. The third party sample audit of 5,500 private slaughter houses is underway, of which around 60 have been audited so far, he added. The FSSAI said it will soon start hygiene rating of fish and meat shops in the country.

"There is no impact of coronavirus. However because of this incident, there is awareness about hygiene in the country. We are trying to improve hygiene and sanitation efficiency in meat and fish markets," Agarwal told reporters on the sidelines of an event here. Hygiene in the country's fish and meat markets is "not good", he said but exuded confidence that the situation will improve in the coming years due to its efforts.

The death toll from China's coronavirus epidemic climbed to 1,750.



MILKBASKET BETS ON PRIVATE LABELS, EXPECTS 40 PC REVENUE CONTRIBUTION BY YEAR-END



Grocery delivery firm Milkbasket is looking at bringing in private labels across categories like dairy, bakery and fresh produce, and expects about 40 percent of its revenue to come from such products by the end of the year. The company has been "experimenting" with private labels and has seen a good response to these products, Milkbasket co-founder and CEO Anant Goel told. "We have been experimenting with private labels for a year across categories like eggs, pulses, whole spices and dry fruits. We are now looking at creating five separate brand lines for dairy, bakeries, food, non-food and fresh produce," he said. Goel added that sourcing of these items is under works, and brand name and other details will be formalised in the first half of the year. "Private labels are already contributing 20-22 per cent of revenues and we expect to double this, get to about 40 per cent by the end of the year," he said. Goel said the company has achieved an overall gross margin of 20 per cent for the business.

"While the margin is higher in Gurugram, it is lower in cities like Hyderabad where we have just started. We expect this to improve and the overall numbers could be around 25 percent by the end of the year," he added.

ROWDY MERMAID KOMBUCHA TO LAUNCH WATERMELON BLOOM FLAVOUR



Rowdy Mermaid has unveiled a new watermelon bloom kombucha flavour that features the soursop fruit.

Each Rowdy Mermaid Kombucha variant has a unique plant-based function – such as balance, clarity, digestion and immunity.

The decaffeinated watermelon bloom flavour is described as an “invigorating elixir” that is packed with soursop and complemented with hibiscus and rose. It serves to quench thirst with its hydration function.

Soursop, with its sour citrus flavour notes reminiscent of pineapple, strawberry and apple, is a nutrient-dense fruit native to the tropical regions of the Americas and the Caribbean, Rowdy Mermaid said.

“When we found a combination of watermelon rind and superfood soursop that pulled out the rich taste of watermelon, we knew our latest science-based flavour was born,” said Jamba Dunn, founder and CEO of Rowdy Mermaid Kombucha.

“Watermelon bloom is packed with antioxidants, high in vitamin C and low in calories, the perfect balance of sweet and floral, and ultimately helps our consumers stay hydrated. We’re looking forward to the first consumer taste tests at Natural Products Expo West.”

IMPORT OF VEGETABLE OILS FOR Q1 OF 2020 34,51,313 TONNE; DOWN BY 4.7%



The Solvent Extractors’ Association (SEA) of India has compiled the import data of vegetable oils (edible and non-edible) for the month of January 2020. The overall import of vegetable oils during Q1 of 2019-20 (i.e., from November 2019 to January 2020) was reported at 34,51,313 tonne compared to 36,20,316 tonne (i.e., down by 4.7 per cent).

The import of vegetable oils during January 2020 was reported at 11,95,812 tonne compared to 12,75,259 tonne in January 2019, consisting of 11,57,123 tonne of edible oils and 38,689 tonne of non-edible oils (i.e., down by six per cent). RBD Palm Oil and RBD Palmolein placed under restricted list

Director General of Foreign Trade (DGFT), Ministry of Commerce and Industry, New Delhi, issued Notification No.39/2015-220 in January 2019, placing the import of RBD Palmolein and Palm Oil under a restricted list to regulate excessive import in to India. The import will now be subjected to licence to be issued by the DGFT. In the meantime, joint DGFT, Kolkata has issued licences for 88,000 tonne of import of RBD Palmolein from Nepal at zero duty under SAFTA agreement.



Niche no longer: clean labels becoming food industry standard

Consumer interest in clean label or natural ingredients continues to rise. Approximately 50–75% of consumers believe that products with natural ingredients or fewer ingredients — or foods with other attributes such as better nutrition, environmental sustainability or ethical sourcing — qualify as clean label. Consumers are lately paying more attention to the labels, lists of ingredients, nutritional values and claims. The clean label ingredients can be identified as emulsifiers, stabilizer, and thickeners (EST), flavour, preservatives, colorants, and others. They are applicable in various industries including bakery & confectionery, dairy & frozen desserts, beverages, oils & fats, snacks, meat products, and others.

Clean label is a growing opportunity globally owing to the health concerns over adverse health effects of artificial ingredients and increasing consumer awareness on the use of consumer-friendly ingredients that are natural, organic, allergen free, non-GMO etc. While posing numerous benefits to society, these label claims help people make healthier decisions at the grocery store, make the food industry more sustainable and improve our relationship with the environment. But as consumer demand for healthy, all-natural products continues to climb, the food industry is struggling to adapt. Manufacturers are scrambling to make a switch to more natural foods with fewer artificial ingredients. To catch up with the clean label norms, they are vying for real ingredients from natural sources that can withstand the rigors of processing, create an attractive food or beverage with an enticing taste and mouthfeel, and supply a decent shelf life.

NATURAL & HEALTHY INGREDIENTS AT THE FOREFRONT:

Changing consumer demand is forcing some of the largest food manufacturers in the world to rethink some of their most successful products. Consumers, have largely been the ones driving new clean label trend, demanding that

companies offer healthier products at their local grocery store. Clean labels and these revised ingredients lists are an attempt to woo over health-conscious consumers. But without a verified set of standards behind the movement, major corporations are struggling to understand what the term “clean label” means and how their decisions will impact their bottom line.

Consumers can't seem to agree on what ingredients should be considered clean and unclear. Natural sweeteners like fruit juice and cane sugar may be too indulgent for some consumers, but for others, this could be the perfect replacement for high fructose corn syrup. All this uncertainty is keeping food manufacturers on their toes as they struggle to understand their customers' specific concerns. As a result, some of the largest packaged food manufacturers are seeing a drop-in sale.

Some manufacturers have struggled to find the balance between switching to natural, clean ingredients and maintaining profits. Returning to the days of using traditional dairy ingredients or eggs, for example, presents issues with price volatility, refrigeration and storage costs, shorter shelf lives, new equipment needs, sourcing, and a host of other challenges. Adding to the difficulty is reformulating products with new ingredients while maintaining the flavor and consistency of the original recipe.

But food manufacturers will need to raise the bar to remain competitive. Consumers want healthy, natural, simple foods, and are actively avoiding foods made with chemical modifiers. This is the core of the clean label movement, and food manufacturers must keep pace by removing artificial ingredients and chemical modifiers from their applications, and replacing them with clean, natural alternatives.

SHIFT IN CONSUMER SPENDING PATTERN:

The trending technologies & rise of eCommerce shopping



is lately exposing customers to a multitude of options when it comes to buying food. All the newer shopping resources are easily connecting consumers with smaller, independent food manufacturers that are a part of the clean label movement. It is becoming way easier for them to order organic, all-natural products from all over the country, instead of having to depend on whatever their local grocery has on the shelf.

As private label food products now make up a considerable portion of all grocery store sales, legacy brands are starting to see a dip in sales. Major food manufacturers have started scouting for ways to get involved with this shift towards smaller, independent food producers.

THE NEW DISCLOSURE TREND - INGREDIENT TRANSPARENCY & SUSTAINABILITY

While clean label refers to a certain type of food, ingredient transparency is something that applies to all foods and beverages. A recent report indicated that the majority of shoppers have transparency on their minds and that most of them would feel a higher sense of trust toward food manufacturers that had complete and easy-to-understand ingredients. The increasing demand for clean & clear labels have strong ramifications for the manufacturers. New product development, product reformulation, and public understanding and acceptance are all impacted.

Keeping product tasty and providing clear nutrition labelling are the key factors influencing consumer appeal when it comes to food & beverage production & reformulations in India. Today's consumers are demanding to know more about the ingredients they consume, and they want to know exactly what's in their products, how they were sourced and produced, how they might affect their health, how any animals involved in the process were treated, and more. Consumers are highly influenced by being aware of ingredients used in the food they consume which is driving the clean label ingredients market globally.

Transparency and clean labels should go hand-in-hand and will be two priorities food manufacturers need to strive for going forward if they want to increase market share and appeal to these trends that are quickly becoming the norm.

To achieve those goals, choosing a supplier that values the same things and follows a strict chain of custody is key.

At HL Agro, we know how important these initiatives are and we take great pride in producing our food ingredients the right way. We procure the NON-GMO sesame seeds from the fertile lands and process them in the most hygienic manner using least of chemical resources to retain the purity & nutritive value of the seeds. Intelligent, sustainable sourcing coupled with precise information of the source helps us in addressing the clean label concerns of our worldwide customers. Safe food is integral to HL Agro's business. An environment friendly approach is touted all across the supply chain to keep a vigilant eye on the hazardous materials & carbon emissions.

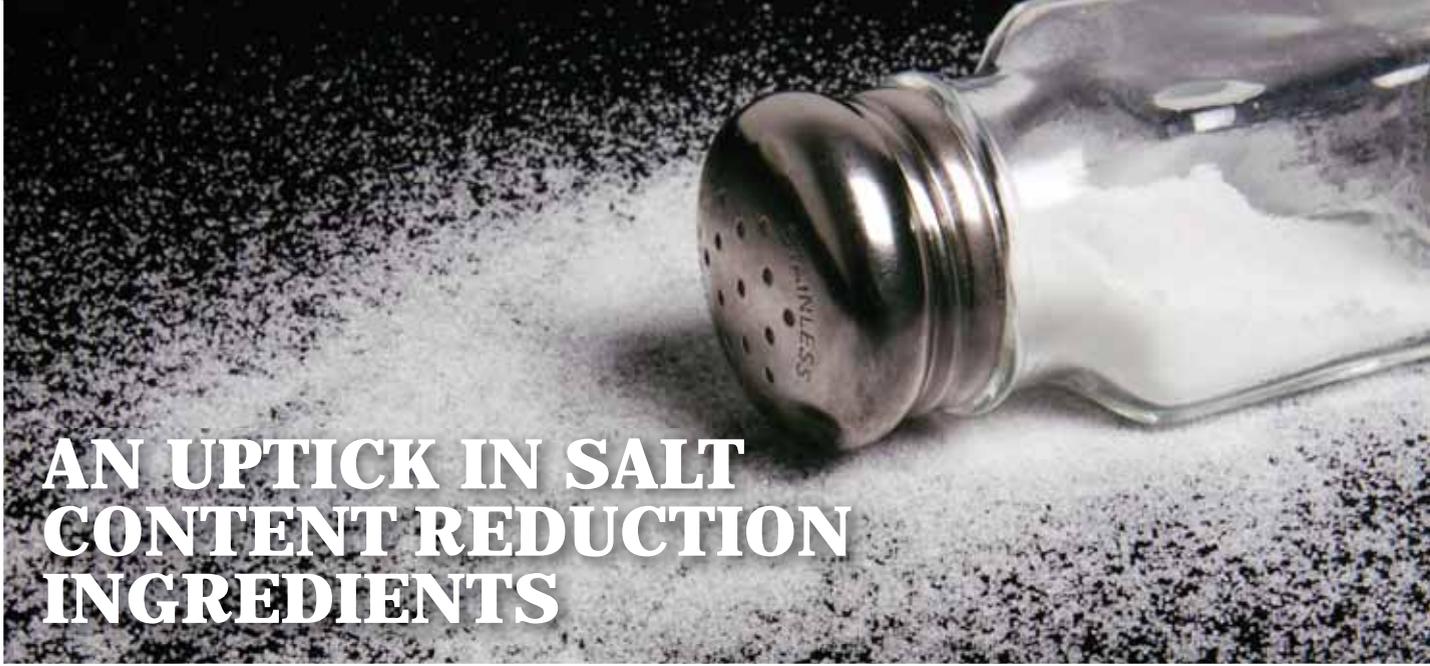
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Winner of the "Agri-Company of the Year" at the 2019 News Corp VCCircle awards, HL Agro Products has earned special accolades for its contribution to the agricultural economy & efforts towards enhancing the market share of the oilseeds & corn starch commodities at the national and global levels. The processing units at HL Agro are fully automated and well equipped with state-of the art technology, imported machinery making it truly the 21st century in its accomplishment. Built on the norms of Good Manufacturing Practices & HACCP guidelines, the plants are capable of processing 22000 MT sesame seeds annually & grinding 300 MT corn daily. HL Agro's sesame seeds processing unit is an SGS certified entity listed with Agricultural and Processed Food Products Export Development Authority (APEDA), India Organic, USDA, Kosher, Halal & USDA Organic and Export Promotion Council. HL Agro now endeavours to burgeon globally by elevating its starch & corn sweeteners portfolio with an array of, Malto-Dextrin, Dextrose Monohydrate, Sorbitol, High-Maltose Corn Syrup amongst others.

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AN UPTICK IN SALT CONTENT REDUCTION INGREDIENTS

Increasing the risk of heart disease and stroke owing to high sodium consumption in food has led to an uptick in the demand for salt content reduction ingredients. The wide applicability of salt content reduction ingredients in meat products and yeast extracts will further propel demand growth. These ingredients are capable of offering enormous benefits such as salt content reduction in processed food and flavor enhancement of the product throughout its life cycle. This scenario has led to immense opportunities for market players to come forth with innovative alternatives to salts. On this backdrop, the global salt reduction ingredients market is poised to reflect a whopping growth rate of over 9% until 2029. To substitute salt from daily food intake, the recent past has witnessed the adoption of salt reduction ingredients, of which glutamates will continue to lead throughout the forecast period, reveals Fact.MR in a recently published report on salt content reduction ingredients market. As per the report, the global salt content reduction market is forecast to surpass US\$ 8 Bn by 2029 end.

KEY TAKEAWAYS OF GLOBAL SALT CONTENT REDUCTION INGREDIENTS MARKET

- Global salt content reduction ingredients market is expected to create an absolute value opportunity of

SALT REDUCTION INGREDIENTS FOR MEAT & POULTRY APPLICATIONS IS EXPECTED TO GAIN 130 BPS BY 2029, AS SUBSTITUTION OF SALT WITH INGREDIENTS LIKE POTASSIUM CHLORIDE AND YEAST EXTRACTS CAN REDUCE THE SODIUM CONTENT IN MEAT PRODUCTS SIGNIFICANTLY

around US\$ 5,075 Mn by 2029 end, adding 1.5X times more value as compared to 2019

- Demand for glutamates as a salt replacement is expected to account for almost 66% of the total revenue share by 2029 in the global salt content reduction ingredients market
- Salt reduction ingredients for meat & poultry applications is expected to gain 130 BPS by 2029, as substitution of salt with ingredients like potassium chloride and yeast extracts can reduce the sodium content in meat products significantly
- Despite losing market share by 2029, consumption of salt reduction ingredients in North America is expected to be responsible for almost one-third of the total incremental \$ opportunity created in the market over the forecast period
- Asia Pacific is expected to register leading growth at an astounding CAGR of over 10% throughout the forecast timeframe, however, the potential of the market in Japan will be on the slower side among all the regions

PRODUCT INNOVATION PIVOTAL TO MARKET SUCCESS

Manufacturers of salt content reduction ingredients are eyeing product innovation, keeping in mind health concerns attributed to the high consumption of sodium salts. Global salt reduction ingredients market is moderately fragmented, majorly dominated by few top players. Thus, companies have been focusing on providing innovative products that can preserve taste and reduce the salt content to a large extent in compliance with product cost reduction.



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Dietary Fibers in Sports Nutrition

Missing dietary fiber in the nutrition of athletes and fitness-driven people

In every day diets, most of the Western people consume far too little dietary fibers. They do not reach the recommendation of the German Nutrition Society/WHO of a daily intake of 30 g dietary fibers. Especially with the nutritional development which is associated with the latest fitness trend more and more people start to work out to be part of the "fit is beautiful" society. As part of this, also the nutrition of "non-athletic people" has changed. Low-carb - high protein is a popular form of nutrition. You can see low carb and/or high protein products all over the commercials and supermarkets with just a low dietary fiber content. However not just people, who do not exercise regularly but also athletes have low fiber intakes. The nutrition of athletes contains a high amount of proteins for the recovery and growth of the muscles and quickly available carbohydrates to get fast energy for their training. Dietary fiber intake is still an unattended topic.



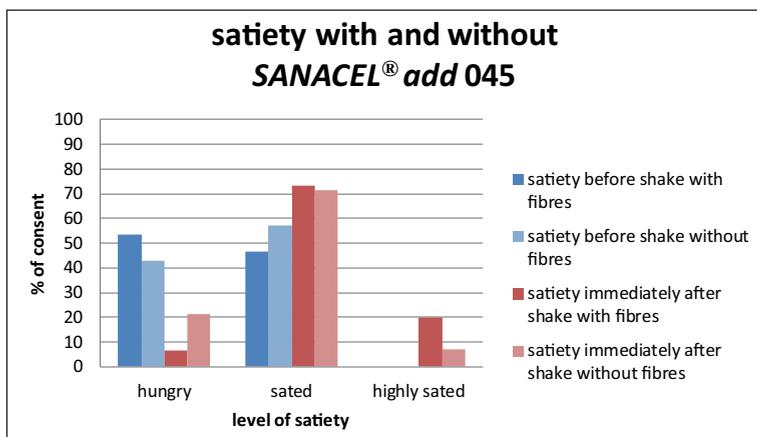
BENEFITS OF DIETARY FIBERS

The right combination of soluble and insoluble fibers can enhance the health of non-athletic and athletic people. Especially for meal replacement insoluble dietary fibers are suitable because they improve the feeling of satiety (Wellness Foods

& Supplements Issue No.1 April/May 2015 Fibers against obesity). They also stimulate the bowel movement that shortens the transit time of digestion. This helps to prevent the bowel wall from harmful substances like carcinogens. The insoluble fibers not just have an influence on the digestion but also on the metabolism. They regulate the blood sugar level by promoting the insulin sensitivity. The soluble fibers also have an impact on the digestion. They can be a protection against constipation because they lead to defecation. Many of the dietary fibers act as a prebiotic. That means the helpful bacteria in the gut can ferment them. This leads to a higher growth rate of these bacteria that supports the protection of the intestinal mucosa. In turn, this supports the immune system by protecting the body from toxins, pathogens and from the leaking gut syndrome. Dietary fibers also have a positive effect on the metabolism. The short-chain fatty acids that are produced during the

Figure 1 shows the level of satiety before and after consuming the shake. 53% started the test hungry, 47% sated and no one highly sated before drinking the shake with dietary fibers. Afterwards only 7% still have been hungry. Most of the participants (73%) were sated after the shake with dietary fibers and even 20% were highly sated.

Before consuming the shake without fibers 43% of the participants were hungry, 57% sated and no one was highly sated. After drinking the shake without fibers still 21% were hungry. Most of the participants (72%) were sated, too. And only 7% were highly sated.



fermentation of the dietary fibers reduce the cholesterol in the blood.

According to the German institute for sports nutrition (DISE e.V.) an intensive training can lead to a leaky gut syndrome which can be prevented by the consumption of a diet rich in dietary fibers.

PROTEIN SHAKES

As already mentioned the nutrition of some people has changed with the latest fitness trend. The consumption of protein shakes and protein products has increased. Many people, not just power athletes, combine their training with a protein shake or even replace a meal to lose weight. Many of these shakes do not contain dietary fibers or if, they contain just soluble ones. A high amount of just soluble fibers can cause flatulence due to the high fermentation rate. That and the previous described positive effects are the reasons why a combination of soluble and insoluble fibers is so important.

However, with the development in the sports nutrition the consumption of protein shakes and the requirements on these products increases. Because of the trend of the “fit and healthy society”, the consumer gets more and more interested in the ingredients of a product. Not just carbohydrates are in the focus of these consumers but also E numbers. The ingredients have to be natural – the ingredients list clean label.

SANACEL® ADD 045 – THE SOLUTION

Therefore an easy solution to incorporate soluble and insoluble dietary fibers into the daily diets of athletes and the fitness-driven population was created. For the CFF GmbH & Co. KG it is always important to develop solutions for the latest market trends. That's why they offer the SANACEL® add 045 as a solution for

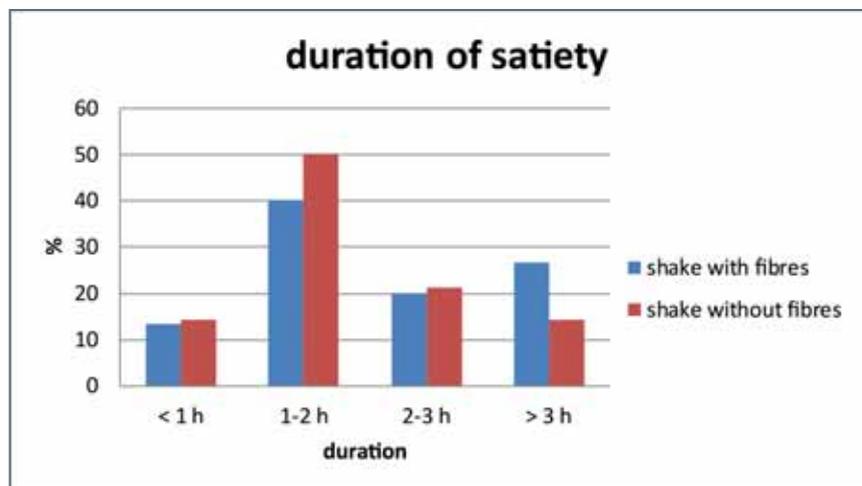


Figure 2 shows the duration of the satiety after consuming the shakes. About 14% of the participants stayed sated for less than an hour and about 20% for 2 to 3 hours after consuming the shake with and without fibers. With fibers 40% and without fibers 50% of the people were sated for 1 to 2 hours. More than 3 hours sated where 27% of the participants that got the shake with fibers and only 14% of the ones that got the shake without fibers.

the mentioned consumer necessity of a natural clean label product combined with the health factor of fiber enrichment. With this fiber blend there is the possibility to create an enriched protein shake with soluble and insoluble fibers and also replace conventional thickening agents with a natural clean label product which creates a creamy mouthfeel.

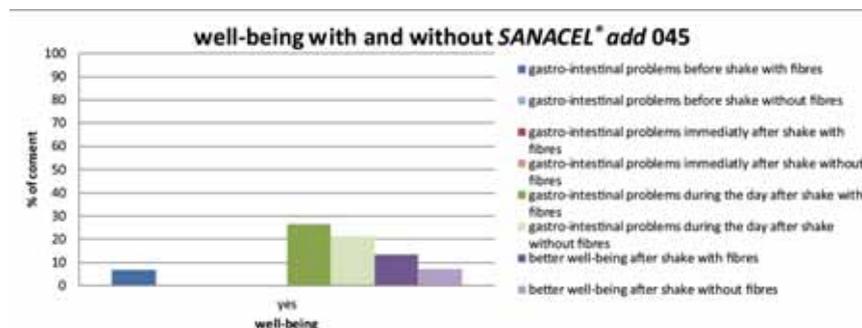
SANACEL® add 045 is a combination of insoluble bamboo fiber and a high soluble

- neutral in color (off-white), taste and odor
- allergen free
- E number free, clean label
- can be easily mixed with the other powdered ingredients

SANACEL® ADD 045 IN AN APPLICATION

The CFF GmbH & Co. KG has done a small consumer study about the consumption of a protein shake containing SANACEL® add 045. The aim of this test was to compare a

Figure 3 shows the well-being during the testing days. The disagreements were unattended since the more important facts are that there are gastro-intestinal problems and if the shake has improved the well-being. Non of the participants had gastro-intestinal problems immediately after the consumption of the shakes. 7% mentioned problems like stomach ache before the test. After consuming the shake with fibers 27% and after the shake without fibers 21% said, they had problems during the day. They mentioned stomach ache, nausea, bloating and heartburn. 13% answered the question if the shake with fibers has increased the well-being generally with “yes”. While after the shake without fibers only 7% said “yes”.



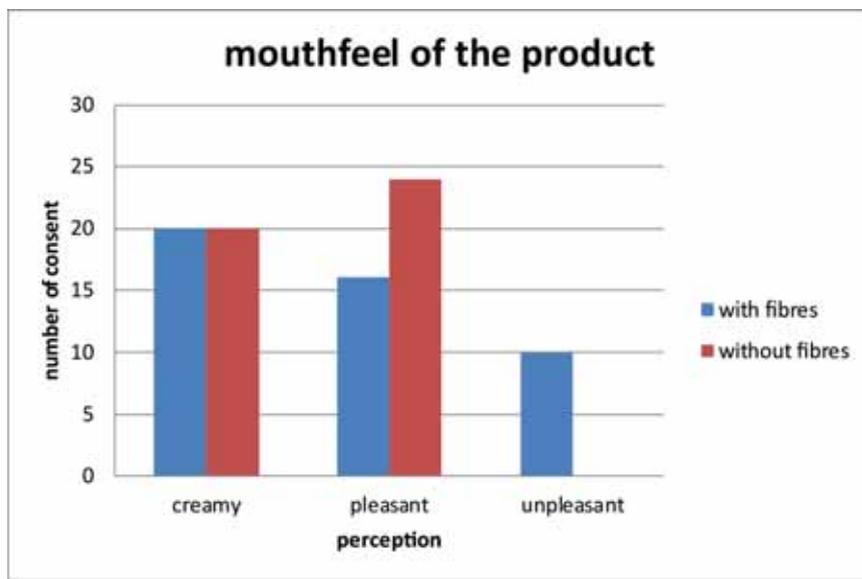


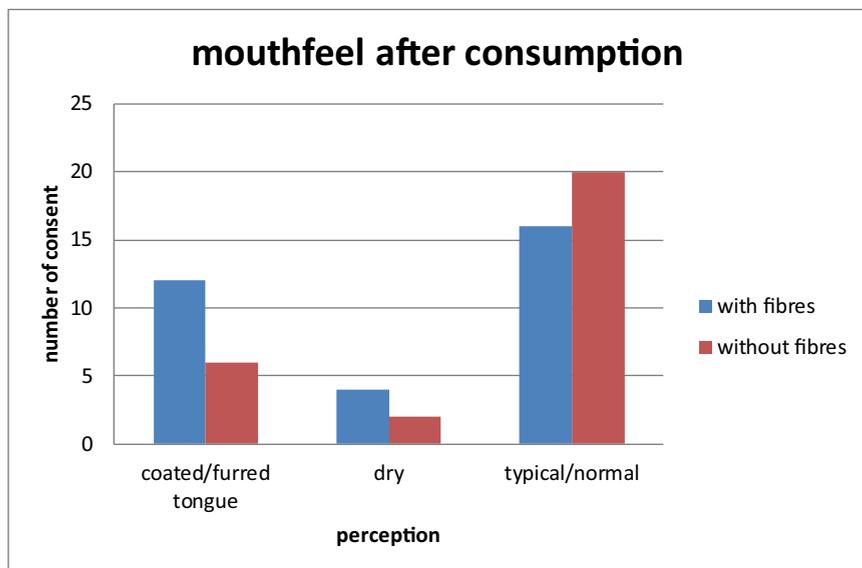
Figure 4 shows the mouthfeel of the shakes while drinking. Multiple answers were possible. 20 participants said that the shakes were creamy. 16 participants perceived the shake with fibers as pleasant and 10 as unpleasant; they mentioned that the shake was too thick. None of the participants had an unpleasant mouthfeel while consuming the shake without fibers - 24 perceived this shake as pleasant.

fiber enriched protein shake with a standard one.

For the test 32 people had to drink a protein shake two days in a row. On day one the shake did not contain fibers. On the second day the test

group were served a fiber rich version of the same protein shake enriched with SANACEL® add 045. The test has been performed as a blind test, the test persons didn't know on which day they received the shake with or without fibers.

Figure 5 shows the mouthfeel of the shakes after consumption. Multiple answers where possible. After the consumption of the shake with fibers 12 participants had a coated/furred tongue, 4 a dry and 16 a typical/normal mouthfeel. After the consumption of the shake without fibers 6 had a coated/furred tongue, 2 a dry and 20 a typical/normal mouthfeel.



The test has been performed on both days at the same time in the morning. Afterwards a questionnaire was completed according to the following three criteria: satiety before and after the shake, well-being before and after the shake and the mouthfeel of the shake during and after consumption. The results are shown in the following figures.

CONCLUSION

The results in figure 1 show that there is a saturation effect with both shakes. After the consumption, the number of participants who started the trials hungry decreased with both shakes. This reduction was higher after the shake with fibers. There where also more participants highly sated after the shake with fibers. This indicates that indeed both shakes have a saturation effect but this effect occurs stronger after the consumption of the shake with fibers. Another argument for this presumption is the result shown in figure 2. 26% of the participants stayed sated more than 3 hours after the shake with fibers, for the shake without fibers it where only 14%. The results from figure 3 show that a few participants had gastro-intestinal problems after the consumption of the shake with and without fibers. This indicates that the two shakes are similar tolerated in the gastrointestinal tract. On the basis that 75% of the participants never drink protein shakes and the problems only occurred for people of this group, it seems that these problems are a result of the unusual high protein content of the shakes. However, this is not a proven presumption.

The results of the questions regarding the mouthfeel show, that both shakes have a nice creamy texture. In general, the shake with fibers was perceived more unpleasant than the shake without fibers. The main reason is the too

thick mouthfeel of the product. Since the fibers have been added on top of a market product we see the cause of this in the combination of thickening agents of the finished protein shake and the additional SANACEL® add 045, which acts also as a clean label thickening agent. The mouthfeel after the consumption is also perceived slightly more negative after the shake with fibers. Nevertheless, some of the participants experienced this negative coated or dry mouthfeel even after drinking the shake without fibers. These attributes are subjective. To classify these attributes better there should be more participants and more of them should consume protein shakes on a regularly basis.

To have more results that are significant the next step would be an

extended consumer test. This test should include all different types of consumers, those who never drink protein shakes up to those who drink them on a regular basis. It also should be conducted over a longer period to see the effect on the gastrointestinal tract and the digestion with a regular consumption.

SUMMARY

Most of the people do not reach the recommended fiber intake in the daily nutrition. Especially athletes and fitness-driven people leave fibers in their special diets unattended. However, a combination of soluble and insoluble fibers are important for an efficient digestion and also some metabolic functions like the cholesterol and insulin metabolism.

CFF GmbH & Co. KG offers with its SANACEL® add 045 fiber blend a balanced combination of soluble and insoluble dietary fibers. With this fiber blend not just the aim of a fiber enriched (protein)shake but also of a creamy, clean label product can be achieved.

Located in Germany and founded in 1977 CFF GmbH & Co. KG distributes dietary fibers from Gehren into more than 70 countries around the world. As a producer of food ingredients, it is very important for CFF to offer high quality technical support, customized fiber solutions and an innovative growing portfolio. Experts can give the appropriate recommendation for each of your specific applications, please feel free to be in touch.

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Analytical Accuracy of Fat-Soluble Vitamins with Agilent Technologies

You need the Agilent fortitude for accurate and simultaneous quantitation of fat-soluble vitamins, ergocalciferol and cholecalciferol in Edible Oil. Vitamin D deficiency is one of the most common nutrient deficiencies and is a well-known cause of rickets, a bone disease seen in children. Taking vitamin D supplements has been shown to have numerous benefits related to cancer, bone health, mental health and autoimmune diseases. Vitamin D from the diet or dermal synthesis from sunlight is biologically inactive and its activation requires enzymatic conversion (hydroxylation) in the liver and kidney. Minor differences in the chemistry of side chains between the two forms of vitamin D results in differences in the site of hydroxylation and leads to the production of unique biologically active metabolites.

Ergocalciferol and cholecalciferol are two different forms of vitamin D and it is one of the essential fat-soluble vitamins that play a major role in many biological activities in the human body. A major source of vitamin D is sunlight exposure to the skin. Most people get their vitamin D requirements through a combination of solar conversion and by maintaining a balanced diet. Liver, fish, eggs and milk together with few other dairy products are rich in vitamin D. In dairy products, vitamin D exists as cholecalciferol. To maintain the vitamin D requirement of the population, ergocalciferol and cholecalciferol are used to fortify food ingredients in cooking oil as it reduce issues related to vitamin deficiency.



An analytical method was developed using the Agilent 6470 triple quadrupole LC/MS system with APCI ionization installed, to ensure accuracy and simultaneous quantitation of these vitamins. Sample preparation is based on saponification, followed by extraction with hexane. The evaporated hexane residue was reconstituted in methanol before instrumental analysis. The sample preparation involved a saponification process, which was the addition of concentrated potassium hydroxide to an ethanol solution of sample, followed by reflux heating at 70°C. This process breaks down the fat to release the matrix-bound vitamins. These released vitamins were extracted with hexane. The extracted hexane layer was evaporated completely and reconstituted in methanol.

ALC/MS method was developed on an Agilent 6470 LC/MS triple quadrupole system installed with an APCI source operated in positive ionization mode. Matrix-matched calibration curves were made for both ergocalciferol and cholecalciferol from 10 to 500 ng/g. Calibration curves were found to be linear within the previously mentioned concentration ranges, with a minimum correlation coefficient of 0.9940. Different concentration levels are prepared for both vitamin D2 and vitamin D3 and plotted to generate the calibration curves. Chromatograms



of the different dilutions used for the calibration curves are merged. System reproducibility was checked using six repeated injections of extracted oil sample spiked at 50 ng/g level. The response %RSDs of six injections of vitamin D2 and vitamin D3 were found to be 4.7% and 3.9% respectively. To evaluate the efficiency of the sample extraction, spike recovery studies were conducted for both vitamin D2 and vitamin D3 in oil samples at two different spike levels: 50 and 100 ng/g. Average recoveries of 91.5 % and 87 % for vitamin D2 and vitamin D3 were calculated.

A sensitive LC/MS/MS method was developed for the quantification of two forms of vitamin D: ergocalciferol (vitamin D2) and cholecalciferol (vitamin D3), fat soluble vitamins. This multiple reaction monitoring (MRM) based method was found to be specific in a complex matrix such as edible oil.

Adopted APCI ionization technology in positive ionization mode reduced the matrix effect. Sample preparation was based on saponification of the oil sample followed by liquid-liquid extraction with hexane. The method demonstrated good reproducibility and decent recovery. This method can be adopted by commercial testing labs involved in the analysis of vitamin D, required for nutritional labeling of edible oils.

To know more download *the App Note*.

Flavor Encapsulation in Food and Beverages

Carrying new and varied flavor combinations into food and beverage applications is a challenge for manufacturers, especially when it comes delivering flavors through natural products. Helen Hook, Marketing Manager at Ingredion EMEA, explores how nature-based flavor carriers can help brands burst onto the culinary scene.

Various new and exotic flavor fusions have hit the supermarket shelves over the past year: lychee and pineapple, Stracciatella and salted caramel and fennel and cardamom to name a few. With global travel now possible at the click of a button and the rise of the 'Instagram effect', exposure to new cultures, cuisines and flavors is increasing consumer demand and expectation for these foods and tastes to be available at home too. The emergence of the 'adventurous consumer' has seen a 17 percent average annual growth in global food and beverage launches with ethnic flavors over the 2013-2017 period.

The applications of these flavors, or combinations of flavors, is broadening beyond the traditional spice or seasoning blends and instant noodles and translating into flavored teas, savoury snacks, sports nutrition and powdered beverages.

Not only do manufacturers need to be aware of these new trends, they must also acquire the capability to effectively encapsulate these flavors and carry them into their final products.

PROCESSING SOLUTIONS

In order to meet demand for these bold and interesting flavors while assuring consistent and cost-effective production, ingredient formulations and processes need to advance. In particular, the process by which liquid-based flavors are converted into powders.

The most common and traditional technique used to encapsulate flavors is spray drying, with plating onto maltodextrin being the other key flavor-carrying process. Plating refers to the physical blending of liquid substances onto a solid carrier, in this case most commonly maltodextrin. This creates a free-



flowing powder which can be used to develop dry-mix seasoning blends, powdered sauces and teas.

With the emergence of more middle-eastern, Japanese and Mediterranean flavors, manufacturers are looking to transform more liquid and oil-based flavors to deliver free-flowing and homogenous powders. Even a small amount of these delicate ingredients can be expensive. This means maximizing plating capacity while carrying a consistent flavor with good shelf-life is a top concern for food producers.

Using traditional plating agents and techniques such as spray drying can prove a challenge, particularly for thick and syrup-like liquids. Due to the viscosity of such ingredients, processing conditions need to be adapted, often adding costs and time.

HIGH-EFFICIENCY PLATING TECHNOLOGY

An alternative solution that has emerged in recent years is a





processing technique that produces a porous starch. Derived from nature, this versatile ingredient requires no special equipment and can be used

in existing mixers and blenders. Due to the non-gelatinized and unique granular structure of porous corn-based plating agents, they can be used to carry high-flavor concentrations. They can also flow freely through processing equipment and mix evenly into food and beverage recipes, even when using thick liquids such as honey and chocolate syrup.

Naturally sourced from waxy corn, plating agents such as Ingredion's N-ZORBIT™ 2144 DG enable food producers to create uniformly blended, flowable powders which streamline the formulation process. The unique, porous structure increases the surface area exposed to liquids, facilitating and improving absorption and delivering a plating capacity as high as 40 percent. This means 100 grams of N-ZORBIT™ 2144



DG plating agent can plate up to 70 grammes of liquid, delivering far more than traditional carriers such as maltodextrin.

As a result, manufacturers can produce highly concentrated, active and vibrant flavors in small volumes of powder, leading to lower cost-in-use and reduced packaging costs.

Coupled with this is a desire for a move towards nature-based versus synthetic extracts, to reduce the volume of chemicals used in food production. The more widely known maltodextrin, often requires the addition of silica dioxide to produce a good flow of powder. But with consumers demanding more natural, simple and recognizable ingredients, there has been a trend in flavor houses and manufacturers seeking to move away from using silica dioxide. In fact, the percentage of flavored snack new product launches featuring a 'no additives / preservatives' label claim in Europe, rose by 60% (in the period H2 2017-H2 2018).

Incorporating ingredients such as N-ZORBIT™ 2144 DG plating agent, which does not require the addition of silica dioxide to optimize the flow of the powder, manufacturers can meet consumer desire for a simple and clean label declaration. The product can be listed as 'glucose syrup' on food labels across Europe, the Middle East and Africa, increasing the

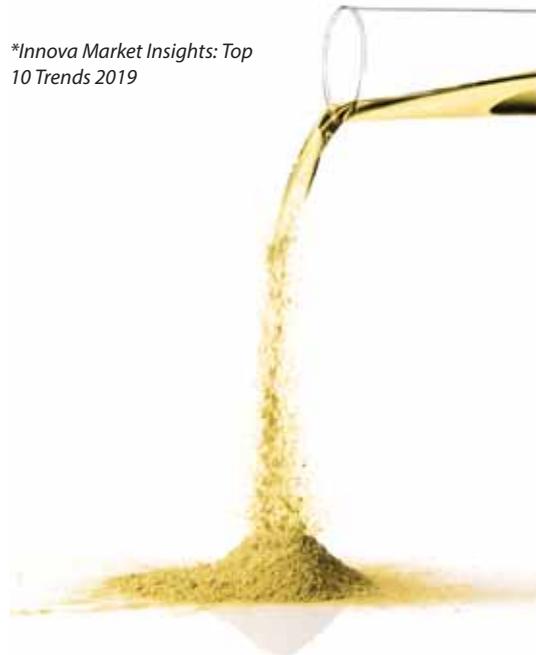


likelihood of greater appeal among retailers and customers alike.

A BURST OF FLAVOR

The rising need for efficient flavor encapsulation of high value-added ingredients looks likely to continue in line with the trend for wider-ranging food flavors. Consumer and market preferences now lean towards more simple labelling and minimal processing, while delivering that all-important intensive flavor burst. The selection of an appropriate and effective process will depend on the compounds, storage and onward processing techniques to be used. Working with a partner that can help navigate the different methods and ingredients available will help manufacturers to capitalize on this growing market opportunity.

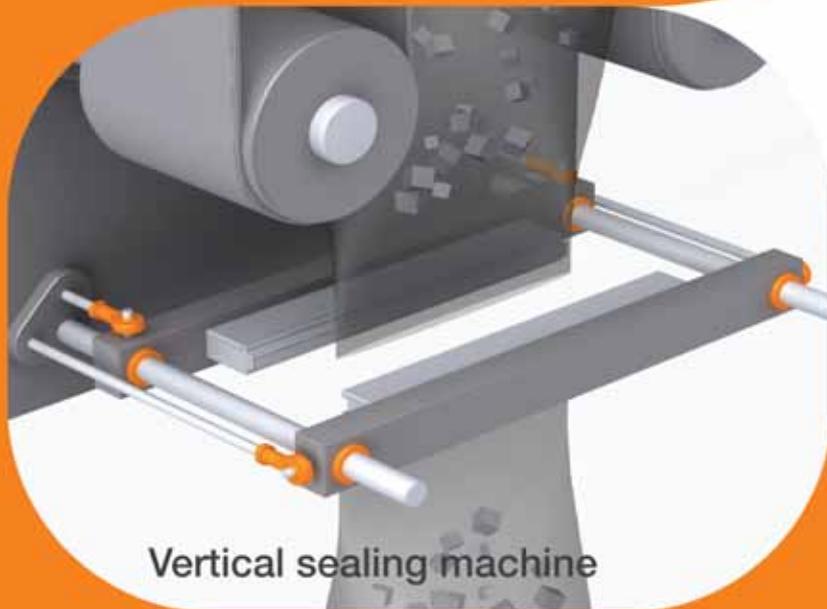
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6 Examples How Product Recovery Can Mean Profit Recovery

Eccentric disc pumps can reduce waste and create notable product-recovery savings in hygienic food and beverage, pharmaceutical and cosmetic manufacturing applications

■ By Johann Fourrat-Besson*

Product waste in hygienic manufacturing industries such as food and beverage, pharmaceuticals and cosmetics has long been accepted as an unavoidable “cost of doing business.” The problem with this mindset is that simply flushing or draining away raw ingredients or intermediate/finished products that remain in suction and discharge piping at the conclusion of production runs or during product changeovers is the same as watching money go down the drain.

The key, therefore, to turning product “waste” into product “recovery” – and, by extension, “profit” recovery – in these situations is identifying and deploying the most efficient and reliable pumping technology, one that can be trusted to strip suction and discharge lines of still useable raw materials and saleable end products. While such technologies

as lobe, external circumferential piston (ECP), twin screw, centrifugal, hose and progressive cavity-style pumps have routinely been used in hygienic manufacturing, their operational capabilities have been found wanting when it comes to optimizing product recovery.

A better, more reliable and more efficient choice is the Eccentric Disc Pump. The pump's unique operating principle – a disc revolves on an eccentric plane within a circular channel – gives it the ability to function in a non-pulsing, low-slip manner with high volumetric consistency. Eccentric disc pumps are also able to pump air, which creates a vacuum effect on the suction side and a compressor effect on the discharge side, resulting in the ability to push a complete product “plug” out of the piping without the need for expensive pigging systems or other line-clearing solutions.

There are numerous and wide-ranging instances where eccentric disc pumps have been introduced to hygienic-manufacturing operations with resulting notable improvements in product-recovery rates and overall operational costs. Let's take a closer look at several examples:

WINEMAKING

Bailly Lapierre, Saint-Bris-le-Vineaux, France, is one of the world's pre-eminent producers of Crémant de Bourgogne, a white or rose sparkling wine made predominantly from Pinot Noir and Chardonnay grapes. When the winemaker recently decided to upgrade its facility with state-of-the-art equipment, it chose eccentric disc pumps for use in several of the winemaking stages. All of these stages require high, nonpulsing flow rates with strong volumetric consistency and minimal slip.

“Eccentric disc pumps have many benefits for us,” said Mathieu Cerveau, a cellarman at Bailly Lapierre. “We produce between four and five million bottles of wine each year, and an eccentric disc pump fills each and every one. We wouldn't be able to operate without them. The high flow rates are a key feature; since we deal with big volumes of liquid, we need a big flow. Another great feature is the strong suction. Because the pump is located in the pressing area, it has to suck the liquid from a lower level and send it through about 40 meters of piping. This isn't possible with some other pumps. Additionally, just as we have

When selecting pumps, wine producers should choose a pumping technology that possesses the ability to recover expensive products and ingredients from the tank and piping systems. This is why Bailly Lapierre chose to install Mouvex® SLS Series Eccentric Disc Pumps.





The SLS Series Eccentric Disc Pump from Mouvex® is able to overcome the challenges presented by higher-viscosity ice cream formulas, while also possessing the operational characteristics that make enhanced product recovery possible.

designed our presses to handle the grapes as gently as possible, we love the fact that eccentric disc pumps feature no excessive shear that puts friction on the wine. But the best benefit for us is the higher rate of product recovery. These pumps can completely drain all of the juice from the piping and from inside the tanks."

ICE CREAM

The evolving combination of a strict manufacturing process and a change in the makeup and viscosity of finished ice cream products recently caused ice cream manufacturer Ysco, Langemark, Belgium, to question the use of centrifugal pumps in its operations. The higher viscosities required stable, non-pulsating flow and high volumetric consistency that centrifugal pumps just aren't able to deliver, with the result being inefficient operation that would lead to excessive product waste. The solution was a seal-less eccentric disc pump that would reduce the risk of product contamination and leaks while maximizing product-recovery rates.

"The eccentric disc pump is idiot-proof, which is very important since we are running 24 hours and everyone has to handle it," said Krist Levrouw, Engineering Assistant at Ysco. "It has to be simple to use, simple to clean and simple to maintain. Every step in the process is important. Every step is complicated, but the eccentric disc pump makes life easier. No stress."

COSMETICS

Headquartered in Tokyo, Japan, cosmetics giant Shiseido has operations all over the world. Its European operation located in Ormes, France, transfers up to four tons a day of high-value raw materials for the manufacture of perfumes, face and body creams, shower oils and gels, and liquid make-up removers. Ensuring gentle handling while minimizing the loss of these expensive components is a daily challenge for the site and one that eccentric disc pumps have been able to reliably meet.

"In our process we need to have as little loss as possible because the prod-

uct is really expensive," explained Sophie Guermond, the facility's Lean Manager. "One kilo of product can cost €30 to €40 (US \$33 to \$44), so if in each batch we lose 50 kilos (110 pounds), the price adds up really fast. It's also really important that there is very little shearing of the product because the creams need to have a specific texture. When the cream is in the tank and passing through the eccentric disc pump, we need the least amount of loss as possible. Because of their operation and reliability, we don't have any daily worries with the eccentric disc pumps."

SOFT DRINKS

Optimizing product quality, operational sustainability and manufacturing costs are the driving forces at Coca-Cola's Hellenic Bottling Company (HBC) plant in Dunaharaszti, Hungary. A key link in the facility's production chain involves the unloading of tankers that are laden with the raw ingredients that will be transformed into popular drinks like Coke, Sprite,

The Shiseido facility in Ormes, France, has the ability to transfer up to four tons of products per day, and thanks to their Mouvex® Eccentric Disc Pumps, the facility can expect a product recovery rate of as much as 80% or more when compared to competitive technologies.



Nestea Iced Tea and Powerade sports drinks. Recently, the twin screw pumps tasked with these unloading responsibilities were having difficulty performing them without freezing up, which would delay the plant's strict "just in time" production schedules. The solution: replacing the screw pumps with highly efficient and waste-averse eccentric disc pumps.

"The reliability of the equipment is very important because we provide high-quality products and to create them we need high-quality equipment," said Zoltán Marincsák, Maintenance Manager for the Coca-Cola HBC Dunaharaszti facility. "With the eccentric disc pump, we eliminate waste, we reduce water and energy consumption, and our maintenance costs are reduced.

"Food safety is critical because it's a hygienic industry and it's very important that there are no seals where foreign material can enter the system, so the hygienic design of the eccentric disc pump is very important," he said. "Although there was a strong argument to justify integrating the pump into the system, the key selling point was the recovery of pure concentrate and the contribution to the facility's sustainability goals. There used to be more than 300 kilograms (660

pounds) left in the truck and pipe system with the old pump. With the eccentric disc pump, less than 100 kilograms (220 pounds) remain in the pump and the piping system. So, if we reduce waste by 200 kilograms per load and recover more than one ton, that saves thousands of euros."

BAKED GOODS

A large United States-based baked-goods manufacturer that produces nearly 600 products in its expansive manufacturing facility was having problems with a leaking pump. A circumferential piston pump that was being utilized to distribute chocolate coating over cookies was experiencing leaks every two weeks that would result in the loss of 100 pounds of coating and a time-consuming interruption in the production process. The problem was solved by replacing the ill-performing pump with a seal-less eccentric disc model outfitted with pressure and flow switches that would eliminate the leaks and improve operational efficiency.

"Dealing with a leaking pump is one extra headache you just don't need," said the plant's Maintenance Manager. "It's nice to get the right pump for the right application and the eccentric disc pump is very low maintenance. I would definitely install another eccentric disc pump in the future."

Sustainability is integrated across every aspect of Coca-Cola HBC's business as the company looks to be a leader in the industry in terms of customer service and cost efficiency. Coca-Cola HBC prides itself on the fact that its 59 production plants, 289 filling lines and 292 warehouse and distribution centers operate in the most environmentally sensitive and cost-efficient way possible.



BREWING

By 2012, Surly Brewing, Brooklyn Center, MN, had grown into one of the nation's most significant craft brewers, forcing it to upgrade and expand its manufacturing operation. The new beer-making equipment, along with Surly's unique brewing method that does not involve any filtration, led to the search for a pumping technology that could steadily push the beer through the production process in an even, nonpulsating manner. Diaphragm and centrifugal pumps weren't able to satisfy those operational demands, and rotary lobe pumps were too maintenance-intensive, but a satisfying solution was found in the eccentric disc pump.

"We're seeing consistent yield increases with the eccentric disc pump," said Surly's Head Brewer. "We don't need downtime. This pump just works and does what it's supposed to do."

CONCLUSION

With operational budgets tightening, manufacturers of food and beverage, pharmaceutical and cosmetic products that rely on hygienic systems would be wise to determine how much cost savings can be realized in targeted product recovery. The fulcrum in optimized product recovery is the pump that is used to transfer raw materials or finished products through the suction and discharge lines. The ultimate solution in this area has proven to be the eccentric disc pump, which, by its method of operation, offers the line-clearing and -stripping capabilities that other pump technologies can't deliver, resulting in less product waste and improved cost-effectiveness.

* Author is the Industry Product Manager for Mouvex® and PSG®

Creating Added Value with X-Ray Technology

■ By Georg Hübner*

X-ray systems secure the product quality and improve the production sequences at the Bavarian company Privatmolkerei Bechtel.

FROM A SMALL BROOK TO A LARGE RIVER

The picturesque Naab meanders gently through the Upper Palatinate. It grows from a brook to a river over its course from the source near Weiden to where it flows into the Danube near Regensburg. The Schwarzenfeld-based Privatmolkerei Bechtel has also grown from modest beginnings into a large company in the 110 years of its history. Managing director René Guhl is the head of the family company in the fourth generation. Over one million liters of milk are processed daily at the constantly expanding company headquarters. The main products are yoghurt, liquid milk and cream cheese.



Production runs 365 days a year in a fourshift system.

CHALLENGING PRODUCTION PROCESS

The processing of raw milk into consumer products consists of complex steps. Products such as quark, hard cheese, drinking milk or butter are produced by means of separators, butter churning machines, milk pasteurizers, filling and packing machines and many more besides. The individual process sequences differ with each end product. The mixture of manual work and the use of machinery is a further challenging feature of the manufacture of milk products.

Hazards are created by material abrasion on the processing machines, wire breakages or the ingress of foreign materials through maintenance work on the building



and lants. Even with the greatest of care as at Privatmolkerei Bechtel, safeguards therefore cannot be dispensed with along the way to zero-error production. In addition to the safeguarding performance itself, however, the acquisition of operating data and the complete traceability of these control systems must be possible.

SECURITY WITH A BENEFIT

"When it came to foreign body inspection it quickly became clear that conventional metal detectors are not suitable for many of our products", says Dr. Thomas Strixner, who is responsible for the "Quality and Product" business division at the dairy works in the Naab valley. Metallic components are part of the packaging for many products, a typical example being the aluminum seals of yoghurt pots. "After an in-depth consideration of the alternative – industrial X-ray technology – we quickly became aware of further benefits." Most available X-ray scanners use standardized Industrial PCs with the corresponding operating systems and are thus very simple to integrate into company networks. "A great advantage of this technology was also that even the weighing of the individual products in the bulk packaging was possible with the appropriate algorithms." Delivery form represents a special problem in the production of yoghurt.

The yoghurt pots are filled and then packed into cartons immediately afterwards. The weighing of the individual products is thus no longer possible. However, an X-ray scanner is capable of visually separating the products and weighing them by means of density differences. Using classic weighing technology it might not be possible to discover a single underweight yoghurt pot, because



several slightly overfilled beakers are possible in a carton. The total weight would then lie within the tolerance despite a single faulty product.

NETWORKED AND RELIABLE – THE RIGHT PARTNER

"The integration of X-ray inspection systems into existing production lines is always a challenge. In this case Mesutronic Gerätebau GmbH offered us the best package for the project planning, the commissioning and the training of personnel", says Dr. Strixner.

A total of six X-ray inspection systems of the type "easyScope" check various products, including inspecting butter in two-track operation or quark in cartons for contamination with foreign bodies or quality defects. They are integrated into the production data acquisition system as well as the company network. This enables the central acquisition of OEE data on the one hand and the traceable

and archive-compliant reporting of performance tests on the other. Apart from that, the manufacturer's technicians can access the plants for remote maintenance after clearance by Privatmolkerei Bechtel. Karl-Heinz Dürrmeier, managing director of the specialists for foreign body detection from Lower Bavaria, has a clear opinion when it comes to connectivity: "In the era of digitisation and Industry 4.0 it's no longer enough just to supply a self-contained, good machine. Our systems are networked in a complex production environment and actively contribute to the supply of an errorfree product of the highest quality to the consumer."

This final goal is shared by both Privatmolkerei Bechtel and Mesutronic Gerätebau GmbH.

* Author is Marketing Manager at MESUTRONIC Gerätebau GmbH

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New Automatic Defect Removal for Potato Strips

Key Technology, a member of the Duravant family of operating companies, has introduced the newest automatic defect removal system for potato strips – ADR EXOS™. As the only vision system on the market designed specifically to cut out defects from potato strips, ADR recovers french fries with defects and turns them into ‘good’ product, directly increasing yield. Featuring a new cutter-wheel design and intelligent software, the next-generation ADR EXOS better manages strip quality and length while improving product recovery to maximize process profitability.

“ADR EXOS offers an extremely fast payback. Processors new to ADR systems can recoup up to EUR €1,75 million worth of product per year with EXOS. Those upgrading from existing ADR5 systems to EXOS will improve their recovery value by as much as €150,000 per year,” said Marco Azzaretti, Advanced Inspection Systems Product Manager at Key. “Customers are telling us the quality of potato crops is becoming more variable due to challenging climate conditions. During seasons when processors risk not having enough good potatoes to meet demand, product recovery becomes even more critical. ADR EXOS is the ideal complement to wet potato strip digital sorting systems and a uniquely valuable tool to achieve the desired product quality at the highest possible yield.”

Building upon the field-proven technology of previous Key ADR systems, EXOS aligns, singulates, inspects and trims both peeled and peel-on wet potato strips of various cut sizes. The new cutter-wheel features even closer spacing between the air-actuated knives to more accurately place cuts closer to defects, which increases the average length of recovered strips.

ADR EXOS introduces a series of additional benefits, including a new knife retention system that eliminates the chance of unintended knife deployments, further improving product recovery and reducing maintenance.



New intelligent software supports enhanced cut strategies, enabling more options for placing cut locations relative to each defect, including making multiple cuts on a single strip. Finally, a comprehensive smart diagnostics system continuously monitors knife cutting operations to detect any possible issues and ensure system performance remains consistent over time.

At production rates of up to 7.7 metric tons (17,000 lb.) per hour for shoestring cuts, and proportionally higher capacity rates for larger product cuts, ADR EXOS inspects defective potato strips that are rejected from an upstream digital sorter or all strips coming to it directly from the cutting equipment, depending on its location on the line. ADR EXOS can be used with Key's recently-introduced VERYX® as well as Tegra®, Manta® and Optyx® strip sorting systems and competitive wet strip sorting systems. Key provides complete engineering support

for combining sorting systems, ADR EXOS and Iso Flo® vibratory conveyors into complete integrated sorting systems.

For inspection accuracy, ADR EXOS relies on LED lights and high-resolution Vis/IR cameras to identify green and brown defects such as bruises and rot. The patented ADR belt conveyor and Iso-Flo® high-speed vibratory infeed conveyor accurately convey each potato strip for optimal inspection and trimming. To effectively handle a variety of strip types from shoestring to steak cut, ADR EXOS offers a “bed shift” capability so lane widths can be easily adjusted. The CleanBelt clean-in-place (CIP) system continuously removes starch

from the ADR belt to prevent build-up, which improves sanitation, reduces labor, minimizes the cost of replacement parts and helps maintain optimal performance throughout the production cycle.

PREMADE SPOUT POUCH FILLING AND CAPPING MACHINE

Nihira Food Engineering LLP, based in Engineering hub of PUNE manufacturing of Packaging machineries for food Products, pharmaceutical and cosmetics, aim to provide localized solutions to Packaging Industries.

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CHEMICALS FOR VITAMIN PREMIX FOR NUTRITION PRODUCTS



Authentication Solutions pertaining to the Food Industry

■ By Nakul Pasricha*

FOOD AND BEVERAGE INDUSTRY'S STRUGGLE WITH ADULTERATION AND COUNTERFEITING

Adulteration in the food industry is a colossal menace globally. It has caught the attention of authorities across the globe and demanded strict action. Regulatory bodies, enforcement agencies, and private sector partners from approximately 78 countries took part in the recent OPSON VIII operation, under which more than 67,000 checks were carried out at shops, markets, airports, seaports, and industrial estates. Around 16,000 tonnes and 33 million litres of likely fake

food and drink were seized, and approximately 672 individuals arrested during the operation. The latest Operation OPSON, coordinated by Europol's Intellectual Property Crime Coordinated Coalition and INTERPOL, resulted in the seizure of more than €100 million worth of potentially dangerous food and drinks.

According to the Grocery Manufacturers Association (GMA) in the United States, it is estimated that counterfeiting of global food and consumer products may cost the industry \$10-15 billion per year.

Unfortunately, the situation is no different in India. Recent news reported in the media shows an alarming state of affairs. Very recently, Delhi Police busted a gang operating for the past seven years who were involved in the manufacturing of fake cumin. More than 450 bags each containing 20 Kg of fake cumin were seized by the police. This fake cumin was made of stone dust, semolina, and a grass paste. Consumption of this could cause serious health hazards. This is just one of the many instances across the country but reflects on the gravity of the situation.

Harcourt Butler Technical University conducted a study in Kanpur city in Uttar Pradesh, which is a big market for edible oil and also supplies to other states. The report found that 70 percent of the mustard oil available in the market is adulterated. According to our (Authentication Solution Providers' Association) report findings, counterfeiting incidents in the country rose by 15% in the year 2019 as compared to 2018 (for the period January – October). The food and beverage industry is amongst the top five sectors in terms of reports of counterfeit incidents.

In another category, FSSAI banned more than 170 brands of coconut Oil in Kerala in 2018, after they were found to be adulterated. Adulteration of food products not only decreases the quality of food products but can also lead to a number of ill effects on health.

REGULATORY FRAMEWORK

Consumer protection laws exist in the country; the regulatory system needs to evolve and become inclusive of essential measures such as an integrated regulatory framework for product recalls. This has become an active practice in other countries and proved its effectiveness. In recent times, product safety movement has gained momentum through regulators such as the FSSAI and Central Drugs Standard Control Organisation (CDSCO) supported by prioritization by policymakers and increased consumer awareness. The new Consumer Protection Bill 2019 is a significant step forward in consumer empowerment as it includes the Product liability clause. This clause empowers consumers by way of provision where consumers can claim compensation from product manufacturers on account of any injury or damage caused by defective goods or deficient services.

The defect in this regard has been defined as manufacturing, design, or deviation from manufacturing specifications.

ACTIVE PARTICIPATION OF CONSUMERS IS KEY

While the strengthening of the regulatory framework is essential, the ecosystem also needs to mature with the active involvement of consumers. The menace of counterfeiting has seeped into the ecosystem so much that we cannot turn a blind eye towards it any longer. The regulatory framework cannot alone contain these malpractices, all stakeholders need to contribute and the most important part of this campaign against counterfeit, illicit and substandard products is building consumer awareness. All stakeholders are required to work together in increasing consumer engagement in verifying product authenticity. The majority of consumers are not aware of their rights; they are not aware of the benefits of taking a bill while purchasing because this can help

them make their case if any harm comes to them due to the quality of the product. Most consumers still do not check the necessary details of products such as expiry date, manufacturing date, packaging, authentication features, etc.

Even if awareness rises, more power needs to be put in the consumer's hands. Consumers can be assured of the quality of products with the marking of FSSAI/ISI/AGMARK. But with the advancement of technology, it has become easier for notorious elements to replicate these marks, packaging and labels. It is also the case in most products that are outside the certification scheme of BIS. It leads to the consumers getting fooled and cheated as they are unable to differentiate between a genuine and a fake product. By building a robust phygital authentication infrastructure, it can be made easier to identify counterfeit products. Adoption of updated authentication solutions enabled with technology and widespread awareness around



these features can help in weeding out counterfeits from the market.

REGULATIONS ARE A BOON FOR BRANDS

Ill effects of counterfeiting on consumers take centre stage, but it has serious damage to brand equity as well. Brands put in a lot of effort to perfect a quality product for consumers and built brand equity by maintaining high quality throughout the market. New regulations guiding brands to implement security and authentication solutions present an opportunity for brand owners to re-evaluate their Brand Protection, Anti-Counterfeiting, and Supply chain strategies. Considering the increased instances in counterfeiting activities, ensuring that consumers receive authentic products and are aware of how to judge the authenticity of the product can help in building brand equity and credibility. It is a small investment towards a long term benefit. The industry and policymakers in the food industry can benefit by referring to tested solutions already adopted and implemented by another industry sector, such as Beverages, Liquor, and Pharmaceutical industry.

When it comes to counterfeiting, there are two significant challenges that brands face - detecting counterfeits in the system and stopping diversion. It is critical to ensure the product is not replicated and has not been removed from the supply chain, tampered with, and then re-entered into the system at a different location - local or global. Anti-counterfeiting solutions can protect manufacturers and end-users from counterfeit or tampered products.

Manufacturers must adopt anti-counterfeiting solutions to protect their products and ensure the safety

of consumers by creating awareness around measures they are taking.

SECURE PACKAGING

Secure packaging helps in ensuring that the product is genuine and has not tampered with; this might also discourage counterfeiters from replicating the product. To prevent tampering and adulteration, food manufacturers can apply deterrents to each of these items of packaging. Physical solutions like a tamper-evident hologram, holographic shrink sleeves, hidden text printed using security or magnetic ink solutions aid in establishing authentication and can act as first deterrents to the counterfeiters. Hidden and covert features help a trained person in distinguishing a fake product from a genuine one.

AUTHENTICITY AND SUPPLY CHAIN TRACEABILITY WILL BE AMONGST THE TOP FOOD INDUSTRY TRENDS IN THE COMING YEARS. IT DOESN'T MEAN THAT EVERY FOOD COMPANY WILL HURRY TO IMPLEMENT TRACEABILITY; THIS PERIOD IS STILL FOR EARLY BIRDS.



Integrating the use of digital technologies over and above physical solutions takes the anti-counterfeiting features to the next level by addressing and curbing supply chain issues. For instance, a unique serial number (URN) is a randomized number printed onto the product's packaging. As it is unique, it can be used to define precisely who manufactured the item, track the journey of the product through the supply chain and the country or state of its origin. This type of serialization at the item level is vital in fighting against counterfeiting. Labelling is the first step in traceability.

By using barcode/QR code labelling/RFID, manufacturers can track products at every point of transition from the warehouse to the point of sale, as each pallet is scanned and placed onto a truck for delivery. Scanning/detection at each point in the supply chain enables manufacturers to record every movement of each product through the system. Combined with the information gathered by the WES (Warehouse Execution System), manufacturers can trace precisely:

- What time the product went into or out of specific controlled environments;
- What time and for how much time the product was out of the controlled environment;
- What time the product loaded onto the vehicle for delivery;
- For how much time the product was on the vehicle and at what temperature it was stored;
- What time the product reached its destination;
- How long the product sat in a location; and
- What time the product was put back into a controlled environment at the delivery location.

Tracking products during the delivery phase is essential not only to ensure the products are on time but tracing these additional variables to help eliminate potential product damage or food spoilage in transit-preventing recalls and lost revenue.

BLOCKCHAIN - GLOBAL EXAMPLE

Cargill (one of the largest food manufacturers) set a great example by debuted a blockchain pilot program that allowed consumers to track where their turkey originated. This program, in select markets, allowed consumers to enter an on-package code at the website HoneysuckleWhite.com to access the farms' location - state and county. They were even able to view the family farm story, see photos from the farm, and also read a message from the farmer. This example shows how blockchain can work to keep secure records of a product's complete provenance, create transparency, and build consumer confidence.

Cargill is also making progress by increasing traceability across their global palm oil supply chain. In India, traceability to the mill level has grown significantly in the last four years – from 0% in 2014 to 90% by the end of 2018.

The tea industry has also been struggling in this respect, so the Tea Board India is also considering

the use of blockchain to implement complete traceability of tea right from the plantation stage till the time it is sold to the buyer.

CONCLUSION

Authenticity and Supply chain traceability will be amongst the top food industry trends in the coming years. It doesn't mean that every food company will hurry to implement traceability; this period is still for early birds. But the demand for radical transparency is growing. Consumers have the right to be delivered the quality of the product they were assured of and paid for. Thus consumers and retailers should demand that the products they purchase and sell are what they purport to be. Consumers—especially Millennials and those even younger – are acknowledging sustainability and ethical production, but at the same time, don't trust brands. End-to-end traceability information can provide trusted proofs about the processes of their favourite brands. For the betterment of general human wellbeing, the loopholes in the system must be plugged in and the ecosystem is made less vulnerable to counterfeiting.

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*** Author is is the President of the Authentication Solution Providers' Association.**

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DKSH opens new master distribution center to support the growth of its Performance Materials business in India



DKSH has opened a new state-of-the-art distribution center in response to the increased demand for its Market Expansion Services and the rapidly growing economy in India.

Mumbai, India, January 13, 2020— Located in the Bhiwandi, Thane District, DKSH's newest distribution center is fully certified and ensures compliance with Indian laws for the storage condition of chemicals and food ingredients. It is equipped with all the latest technology for logistics and warehousing operations, including dock levellers, vertical racking, reach trucks for speedy turnaround and ambient storage.

The center is primarily focused on supplying ingredients and specialty chemicals to customers in the food and beverage, personal care, pharmaceutical and specialty chemicals industries throughout western India. The center enables consolidation and joins other distribution centers located strategically closer to customers in North, West and South of India.

Atul Nagarkar, Managing Director, DKSH India, commented: "We are very proud to inaugurate our new distribution center to serve the increasing demand for specialty chemicals in the local market. The new distribution center will allow us to serve our valued customers and to also create new business opportunities as strategic partners to our clients."

The new facility, which further enhances DKSH's already robust distribution network in India, will reinforce the company's position as a leading Market Expansion Services provider for Performance Materials.

ABOUT DKSH

DKSH is the leading Market Expansion Services provider with a focus on Asia. The Group helps other companies and brands to grow in the Consumer Goods, Healthcare, Performance Materials and Technology sectors. DKSH's portfolio of services includes sourcing, market insights, marketing and sales, distribution and logistics as well as after-sales services. Publicly listed on the SIX Swiss Exchange, the Group operates in 35 markets with 33,000 specialists, generating net sales of CHF 11.3 billion in 2018. With its strong Swiss heritage and long business



tradition since 1865, DKSH is deeply rooted in Asia Pacific. The DKSH Business Unit Performance Materials distributes specialty chemicals and ingredients for food, pharmaceutical, personal care and various industrial applications. With 46 innovation centers and regulatory support worldwide, we create cutting edge formulations that comply with local regulations. With around 1,080 specialists, the Business Unit generated net sales of CHF 960.4 million in 2018.

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“How long will my 3D printed gear for food & packaging industry last?” New igus online tool predicts lead time



Picture PM3019-1
The service life of wear-resistant 3D printed gears now calculated with new online tool in seconds. (Source: igus GmbH)

Free online expert provides concrete statements on the service life of wear-resistant 3D-manufactured gears

How long will my gear last? To answer this question, igus has now developed the gear service life calculator for its 3D-printed gears made of the laser sintering high-performance plastic iglidur I3. With the new online tool, the user receives a concrete statement in a few seconds about the service life of the wear-resistant part.

In some gearboxes, gears are used to change torque or speed through one or more stages. Since gears with complex involute teeth are often required, which cannot be designed without aids, igus developed the gear configurator two years ago. This was expanded last year with the capability to configure double gears. In a few steps, the user only needs to enter the specifications of the required gear, such as the tooth module, number of teeth, width and inner diameter of the hole. This automatically displays a 3D model that can be exported as a STEP file. By uploading the file in the igus 3D printing service (www.igus.in/3Dprintservice), the configured gear made from the extremely durable laser sintering material iglidur I3 can be ordered immediately from igus. So that the customer can also determine the service life of his wear-resistant gear, igus has now developed the gear service life calculator. By means of this, the user receives in just three steps a concrete statement about the service life and the application limits of his gear pairing.

Get the precise service life in just three steps

In step 1, the user must first enter the number of teeth, the width and the tooth module of the gear pairing again. Here the customer can choose between iglidur I3 gears, a metal or another plastic. In step 2, the tool asks for the speed and torque of the large or small gear, depending on the which gear's values are available. Step 3 is to determine the duty cycle of the printed gear, the mode of operation, the ambient temperature and the safety factor. Based on the specified parameters, the new online tool can determine the service life of the 3D printed gear in seconds. This makes maintenance predictable in advance.

Printed gears convince in the pivot test

The high-performance plastic iglidur I3 has been specially developed for the production of wear-resistant parts such as gears in the laser sintering process. The material is abrasion-resistant and durable, as shown by an experiment in the company's own 3,800 square metre test laboratory. Here, the gear made of iglidur I3 took on a POM injection-moulded gear and a POM machined gear in a pivot test at 1440°C at a speed of 0.1 m/s and a torque of 2.2 Nm. All gears had 30 teeth and a width of 16mm. While the injection-moulded gear made of POM failed after just 4,000 cycles and the machined POM gear broke down after 12,500 cycles, the iglidur I3 gear withstood almost 20,000 cycles.

The gear service life calculator can be used for free at www.igus.in/gear-expert.

ABOUT IGUS

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

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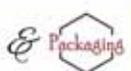


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Less Plastic, More Communication: New Concept for Modified Atmosphere Packaging

Just in time for IFFA 2019, the world's most important trade show for the meat industry, SEALPAC launched eTray®: a cardboard tray with plastic inlay that contains up to 40% less plastic compared to common MAP trays. The concept provides an outstanding solution for sustainable packaging of meat and convenience products.

"GO sustainable!" was SEALPAC's striking motto at this year's IFFA. With eTray®, the company introduced yet another innovative packaging solution that saves precious resources. As such, the packaging specialist is completely in line with the European Strategy for Plastics in a Circular Economy, which demands more environmental protection and reduction of plastic waste. Increased recycling and the development of more sustainable packaging solutions should become primary targets for the industry. According to the latest regulations, all plastic food packaging in the EU must be recyclable by 2030. Here, the ability

to separate individual packaging components has therefore become extremely important. Plastic materials for vacuum or modified atmosphere packaging, especially in the fresh meat segment, are essential to pack these products in the most hygienic way and according to the requirements of the industry. To generate more sustainable packaging, our motto with regard to plastic can therefore only be "as much as necessary, as little as possible".

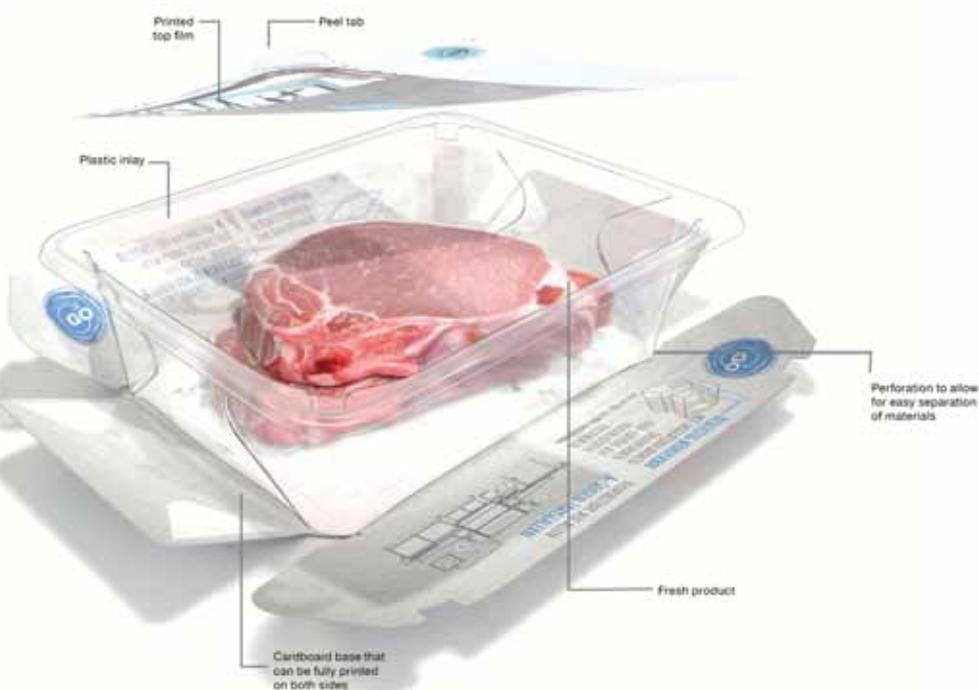
LESS PLASTIC, MORE COMMUNICATION

With eTray®, SEALPAC has developed a solution that fully meets

the market requirements. The trays are pre-fabricated by means of a special thermoforming process, during which the thin plastic inner layer is added to the cardboard carrier. This layer purely serves as a sealing and barrier medium. After use, the cardboard carrier and plastic inlay are easily separated. The solution results in significantly less waste, while allowing for sustainable disposal and recycling. Based on one of the most common PP tray sizes in Western Europe, 190 x 144 mm, you will save up to 40% in plastic. Both the inside and outside walls of the cardboard tray are suitable for high-quality printing, hence providing plenty of space for branding and design. There is the additional option of integrating seethrough windows for an enhanced view of the product.

ABSOLUTELY RELIABLE

Owing to the highly stable, uninterrupted sealing edge, each tray is hermetically sealed under MAP on all of SEALPAC's A-series traysealers, hence ensuring the safest packaging process. The innovative eTray® is just as reliable as a conventional plastic tray, suitable for denesting and allows for smooth transport across the packaging line. The system offers high-quality meat, seafood, poultry and convenience products optimal protection whilst ensuring an eye-catching appearance at retail.



PACKAGING INDUSTRY TAKES RESPONSIBILITY

When it comes to careful use of resources, the packaging industry has already made considerable progress in the past decade. As Marcel Veenstra, Marketing & Communications Manager at Sealpac International, explains: "Once again referring to the popular tray size of 190 x 144 mm for modified atmosphere packaging of fresh meat, such trays used to weigh around 18 grams in the year 2004. In close cooperation with leading tray manufacturers, we have already been able to reduce the weight to just below 10 grams in 2018. With the launch of eTray®, we are once again achieving a significant plastic reduction that sets new standards."



Requiring Subject Matter Experts

Food Industry Capacity & Skill Initiative (FICSI) is an industry led body promoted by the Federation of Indian Chambers of Commerce and Industry (FICCI) with financial support by National Skill Development Corporation (NSDC) focusing to create a robust and vibrant eco-system for quality education and skill development in the Food Processing Sector in the country.

FICSI invites applications for the position of Subject Matter Experts (SME) in sub-sector: Bakery, Fruits & Vegetables Processing, Dairy Products, Cold Chain & Milling Industry. The SMEs will be the member of advisory board of FICSI and will be providing support for the Skill India Initiative.



Responsibilities

1. Reviewing the present Qualification Packs and suggesting changes.
2. Reviewing the learning resources already prepared and suggest changes to align them with industry needs.
3. Advising in creation of new job roles and qualification packs in existing or new subsectors.
4. Augmenting the assessment process.

Eligibility

The applicant must be a graduate in food science/technology or allied sector with overall 10 years of experience in manufacturing in food processing of which 5 years in the relevant subsector.

The assignment is part time and entails commitment of about 15-20 hours per month over 6 months. Suitable honorarium will be paid.

Please send in your resume alongwith the CV by 15th April to: admin@ficsi.in

Thinner is more Sustainable – Foodstuff Packaging gets Lighter and Lighter

Packaging performs an essential service where foodstuffs are concerned. Over the years, technical advances have substantially reduced the amount of material required.

Foodstuffs would not survive without packaging. Packaging protects the contents against harmful influences and ensures a longer shelf life, in addition to food safety. Thanks to the latest packaging materials, these requirements can now be fulfilled with much less material than a few years or decades ago. Packaging designers have succeeded in developing packaging from thinner and thinner material, while improving its protective function. According to the Gesellschaft für Verpackungsmarktforschung (Society for Packaging Market Research, gvm), plastic packaging consumption has decreased by 35 percent compared to the state of the

art in 1991. And in that same period, according to IK Industrievereinigung Kunststoffverpackungen (the Plastic Packaging Industry Association), packaging has become 25 percent lighter. Increases in material efficiency in plastic packaging since 1991 resulted in a saving of around 2.6 million tonnes of CO₂ in 2013, gvm reports.

This was made possible by reducing wall and film thicknesses, improved material properties, and optimised shaping and processing techniques. Despite increased demands on packaging such as re-sealing and divisibility into smaller units, it was still possible to save materials. The same applies to drink cans made of

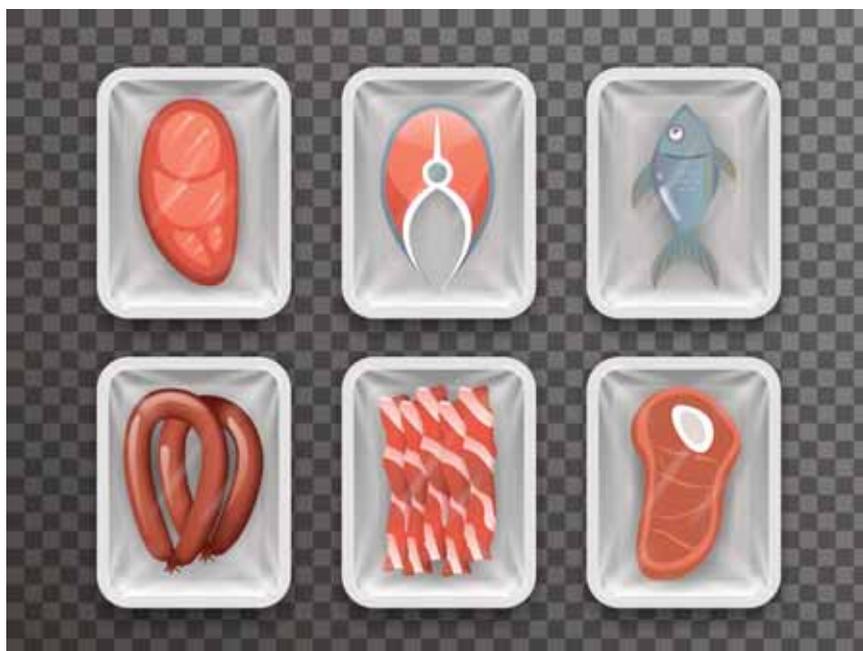
tinplate, for example, which are now 60 percent thinner than in 1974.

DOWNGAUGING TURNS LESS INTO MORE

Thinner film solutions have reduced the use of resources for flexible packaging of the kind specifically used for foodstuffs. "Downgauging" is the umbrella expression for measures in this area. Briefly, it means turning less into more. Maximising efficiency without compromising on quality. In practice, downgauging refers to the process of replacing a traditional thicker film with a thinner film that offers better performance. The providers of films and packaging machines represented at FachPack demonstrate time and again that they are devoting maximum effort to this task. The advances they are making in packaging design now make it possible, for example, to pack fresh products like meat and fish in skin packaging that uses much less material. The products are placed on a tray that is then sealed with a skin film. Just by switching its ready-packaged poultry range to this type of packaging, discount retailer Netto aims to reduce its plastic waste by up to 13 tonnes per year. The company reports that, compared to traditional plastic trays of the same size, the very thin, airtight skin film should achieve a saving in packaging material of up to 60 percent.

WEIGHING UP THE ALTERNATIVES

Other adjustments in addition to using thinner materials can be used



to cut down material consumption. For example, manufacturers can adjust the size of packaging to save unnecessary space. Practical refilling solutions are also available in the case of foodstuffs that are bought in for stock. Refill packaging is subject to fewer functional requirements, or larger formats can be used. Appropriate designs for sponsor packaging can boost customer loyalty at the same time. Traditional examples in this area are salt and spices.

If the ability to cut down on materials reaches its limits, consideration should be given to replacing particular materials with solutions with a lower impact on resources

– if this can be done without compromising on their protective function. Possible strategies here include replacing plastic with fiber or paper trays. Alternative combinations of materials with organic plastics could also help to cut down on material consumption. These measures come under the heading of eco-design, and include a comprehensive analysis of the environmental impacts of packaging.

GREEN AS A DESIGN PRINCIPLE

The all-encompassing approach represented by eco-design goes beyond primary packaging to include secondary packaging, product logistics and also recycling.

Especially in the context of Germany's new Packaging Act, there is increased pressure to further optimise packaging design and improve recyclability. Eco design has progressed in the meantime from a niche to a mainstream topic in development departments. Even before the new Packaging Act was introduced, designers were aware that even minor reductions in materials can add up to big savings across large sales volumes. In this connection it is not only the material that plays a key role. More can also be achieved by drawing on technical innovations. When cutting out top films, for example, a tighter pattern – if the film properties will allow it – can help to reduce film consumption.

JELLY CANDY MAKING PLANT

Type of Jelly : Pectin, Carrageenan, Gelatin,
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Capacity

- 350kg/hr, 500kg/hr, 1000kg/hr
- 40 cavity/stroke

How to process



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- Cooking is carried under vacuum system to avoid burn flavour and improve texture and finally to attend required consistency and deg. Brix.
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Aseptic Packaging

■ By P. V. Narayanan

The advent of Aseptic Packaging has enabled the adoption of modern technology replacing traditional canning techniques such as retort and hot filling canning and use of preservatives and refrigeration. A major advantage is room temperature shelf stability and achieved through filling a sterilised package with a sterile product under a controlled hygienic atmosphere. By and large aseptic packaging is used for liquid products like milk and juices. The process essentially involves sterilisation of the liquid food externally outside the package by ultra-high temperature. The

process rapidly heats and cools the product before filling. The process also ensures a minimum amount of thermal stress on the product ensuring safety. Three major factors come into play viz the material, the product and the filling/packing atmosphere. The material is pre-treated or sterilised so also the product pre-sterilised. Both enter into pack forming cum product filling and completion of the filled and closed pack in an environment of total hygiene. It is these process parameters that provide a high shelf life even without refrigeration or preservative.

PACKAGING MEDIA

The aseptic packaging media is a combined structure generally known as a laminate consisting of high-quality food grade paperboard, aluminium foil and polyethylene. Each of this substrate contributes their known specific property-functional, thereby enabling to achieve a unique benefit of the aseptic packaging. Paper board offers substance, dead fold, and stiffness beside print acceptance- a resultant brick shape (rectangular). Polyethylene is the innermost layer in contact with the product and is the sealant medium providing a leak-proof pack. Aluminium foil is the barrier against oxygen (gases), moisture and light. A protective coating or polyliner is provided on the exterior surface that enables the pack dry and /or adds to resistance to enviroexposure. The essential barrier is provided by the foil. The aseptic system is relatively expensive but considering convenience, savings in refrigeration, no preservative, etc. the add-on benefits only justify the added cost.

EXTENDED DEVELOPMENT

An extended technology was also attempted in the form of Aseptic pouch packaging to make the system more affordable to the consumer. The material combination was polymer substrates with aluminium foil but has not taken off considering cost affordability and value proposition effective.

BENEFIT ANALYSIS

The aseptic pack being portable, lightweight and not fragile provides a high degree of convenience. It is



THE ASEPTIC SYSTEM IS RELATIVELY EXPENSIVE BUT CONSIDERING CONVENIENCE, SAVINGS IN REFRIGERATION, NO PRESERVATIVE, ETC. THE ADD-ON BENEFITS ONLY JUSTIFY THE ADDED COST.

food safe as the aseptic process and the pack together ensure that the product inside is free from harmful microbes and environmental contaminants. The sterility created enables the pack to provide longer shelf life without refrigeration. Based on the shelf life needed the laminate structure could be altered. The resultant advantage to the consumer is savings in energy cost and being easily portable allows use as a required product. Quality is more assured as the aseptic process employs lower heat with better retention of nutrients as near as to the original texture, taste and colour. The other significant feature is a low package to product ratio-more efficient enviro needs. Compared to glass and metal or plastic basic aseptic material is transported and stored flat or rolls resulting in considerable storage space and freight advantage. It is estimated that a semi-trailer truck can transport 15 million empty packs as against 1.5 million glass bottles. The rectangular shaped packs are space-efficient and being lighter-weight truck space utilisation is better.

Being multilayer laminate, recycling of the throw away used packs had

been a challenge. The composition generally is 74% paper, 24% polymeric film and 6% aluminium. However, technology now developed enables recycling and the paper component recovered as pulp converted into a board and is reused for cartons.

OTHER ASPECTS

The foregoing primarily addressed the aseptic consumer packs with their USPs of relatively lower cost, lighter weight, reduced shelf/storage space and energy benefits. The aseptic system also enables the products to be filled at an ambient atmosphere and the products packed include fruit juices, nectars, tomato paste besides milk. The aseptic system, however, is not confined to the consumer pack but also adaptable for the bulk system as well. Pulp and concentrates of tropical fruit and tomato paste are also packed in 55-gallon bags and stored in drums for reprocessing and exports. Bag-in-Box concept generally are 5L to 20 L. Aseptic packaging system of bulk essentially constitutes Tinline container with multilayer laminate with metallised polyester or aluminium foil as a substrate, placed inside. The process is sterilising and filling, steam

under pressure. Bags are sterilised by gamma irradiation, filling in an environment of steam or hot sterile air and caps sterilised by Hydrogen peroxide, Chlorine, Iodophor solution or peracetic acid chemical sterilant for cleaning tanks, purged with sterile nitrogen. The sterile product is filled from the top.

The packaging material used for aseptic pack-sterilisation should be:

- Compatible with the product
- Easily removable
- Free of health hazard
- Enviro compatible
- Cost effective

DEVELOPMENTS

Over the years the industry has witnessed considerable technological advancements encompassing materials, process and machinery and probably markets as well. These could be broadly stated as:

- A recent development is aseptic drinks filling technology – a multi-functional system that provides customers with the capacity to switch between a range of produces from



carbonated to still aseptic beverages and vice versa. This new technology uses a counter-pressure volumetric electronic filling valve. It can also fill products with fibres upto 2 mm long and dia 3mm (GAE Group, Germany).

- A new aseptic version that provides new opportunities in the dairy ad beverages industry. The new version enables container decontamination by e-beam with the latest sterilisation module. (SERAC, France)
- Adoption of an octagonal shape to fit contours of hand with a large resealable opening and the metallic effect called TetraPrisma Aseptic Edge 250ml package. The process development included microfiltration to boost the protein content and direct heating technologies to improve product taste (Tetrapak, China).
- The development addresses the growing market for healthy plant-
- based alternative beverages instead of added sugar juice drinks. Container selected is strong, unbreakable, transparent and safe with recyclability. The absence of sterilised aluminium foil due to the tightness between the bottleneck and the cap has the added advantage. (Sidel.com)
- The aseptic carton developed uses renewable raw materials to save fossil resources and helps to reduce the impact on the environment. The carton packs come in 1, and 1.5l capacity. Oil based polymers used to laminate the paperboard are combined with cent percent plant based material via a mass balance system. The pack has a carbon foot print lesser of the order of 30-65% and is considered the most sustainable packaging solution. (SIG, Switzerland)
- Signature brand aseptic pack is said to contain 70-80% paperboard from renewable wood sources. The polymer used for

laminating the paperboard and making the closure are linked to plant-based material. In this, the polymer used in the pack has an equivalent amount of bio-based feedstock and fossil-based material in the manufacture of the polymer. (SG Combibloc, Switzerland).

- Development of the 2 step sterilisation has the key advantage of being simpler to perform and product dependent parts and moulds can be replaced much faster than on a sterile blow moulder. Preform sterilisation enables the bottle material to be disinfected upstream of the stretch blow moulder. Also, the room within a room design provides both hygienic safety and ease in operation (KHS GmbH, Germany).
- A new aseptic PET line produces one lit. Bottles and newly designed 2L bottles for milk. The new design includes a reference to the customer's branding on the top part of the container and shapes the PET avoiding any splashing effect during product pouring. The total system combines perform and cap sterilisation, blowing and sealing functions in a single enclosure for a complete sterile filled and capped PET bottle (SIDEL, Italy).

The globe will continue to witness more and more such developments addressing newer challenges and market needs. Aseptic packaging stands to grow and establish further preferences.

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