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Highlights

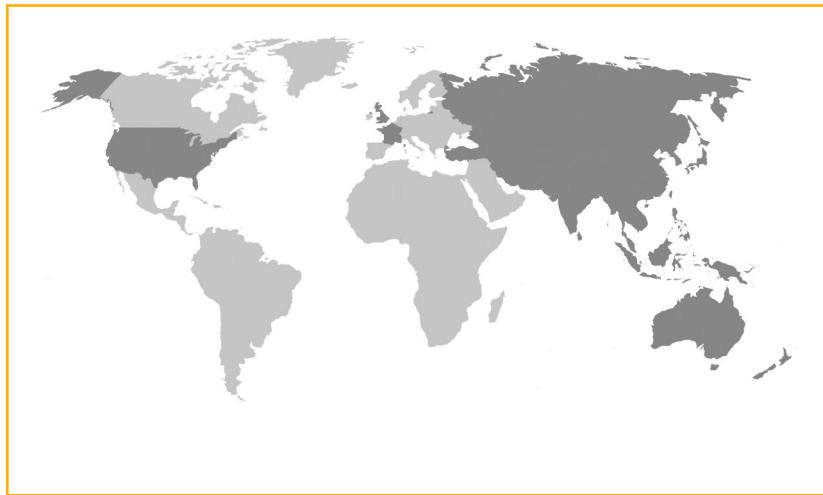
- Method to detect harmful bacteria in food
- Milk chocolates to get healthier
- Nanoparticle based edible coating
- Affordable solutions for fruit drinks
- New packaging solution extends shelf-life
- Stretch blow moulder



The **Asian and Pacific Centre for Transfer of Technology (APCTT)**, a subsidiary body of ESCAP, was established on 16 July 1977 with the objectives: to assist the members and associate members of ESCAP through strengthening their capabilities to develop and manage national innovation systems; develop, transfer, adapt and apply technology; improve the terms of transfer of technology; and identify and promote the development and transfer of technologies relevant to the region.

The Centre will achieve the above objectives by undertaking such functions as:

- Research and analysis of trends, conditions and opportunities;
- Advisory services;
- Dissemination of information and good practices;
- Networking and partnership with international organizations and key stakeholders; and
- Training of national personnel, particularly national scientists and policy analysts.



The shaded areas of the map indicate ESCAP members and associate members

Cover Photo

Vacuum Sealer of the Davao Food Processing Innovation
Center, Philippines

*(Credit: Rodolfo P. de Guzman/S&T Media Service, Department
of Science and Technology, Philippines)*

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WHO urges global action on sugary drinks

According to a new World Health Organization (WHO) report, taxing sugary drinks can lower consumption and reduce obesity, type 2 diabetes and tooth decay. Fiscal policies that lead to at least a 20% increase in the retail price of sugary drinks would result in proportional reductions in consumption of such products, as reported in “*Fiscal policies for Diet and Prevention of Noncommunicable Diseases (NCDs)*”.

Reduced consumption of sugary drinks means lower intake of “free sugars” and calories overall, improved nutrition and fewer people suffering from overweight, obesity, diabetes and tooth decay. Free sugars refer to monosaccharides (such as glucose or fructose) and disaccharides (such as sucrose or table sugar) added to foods and drinks by the manufacturer, cook, or consumer, and sugars naturally present in honey, syrups, fruit juices, and fruit juice concentrates.

According to the report, national dietary surveys indicate that drinks and foods high in free sugars can be a major source of unnecessary calories in people’s diets, particularly in the case of children, adolescents and young adults. It also points out that some groups, including people living on low incomes, young people and those who frequently consume unhealthy foods and beverages, are most responsive to changes in prices of drinks and foods and, therefore, gain the highest health benefits.

Source: <http://www.who.int>

Global markets for food processing equipment

Research and Markets, Ireland, has announced the addition of the “Global Markets for Food Processing and Food Packaging Equipment” report to their offering. The global market for equipment used in food processing and packaging is expected to reach nearly \$31.5 billion by 2020 from about \$25.7 billion in 2015, rising at a compound annual growth rate (CAGR) of 4.2%, from 2015 to 2020.

This report focuses on the global market of food processing and packing equipment and provides an updated review including basic design and its applications in various segments of food processing and packing such as meat, fish and poultry, milk, fruits and vegetables, beverages, industrial bakery products and grains. The scope of the study is global. Each market is analyzed and its application, regulatory environment, new products and advancements, market projections and market shares.

The geographical regions covered in the report are North America, Europe and emerging markets. Emerging markets covers all countries such as India, China, Japan, South Korea, Taiwan, Africa, Australia, New Zealand, Canada and so forth. Also included in the report are relevant patent analysis and comprehensive profiles of companies that lead the food processing and packaging equipment industry.

Source: <http://www.prnswire.com>

FAO tackles antimicrobial resistance

The Food and Agriculture Organization of the United Nations (FAO) has pledged to help countries develop strategies for tackling the spread of antimicrobial resistance in their food supply chains. In addition to public health risks, AMR has implications for both food safety and food security and the economic wellbeing of millions of farming households across the globe.

The organisation is aiming to help governments put in place national strategies for tackling AMR and AMU in their food and agricultural sectors by mid-2017. With demand for animal-sourced food products projected to grow steadily over the coming decades, FAO predicts the use of antimicrobials will continue to rise.

Source: <http://www.foodprocessing.com.au>

Sri Lanka plans IT backbone for tea industry

Sri Lanka plans to introduce an IT backbone to improve the efficiency of the tea industry in order to improve productivity and quality. According to the government, although there is a high price for Sri Lankan Tea with its qualities in the world market, increase of producing cost and global situations has gradually reduced the profit in the industry.

In this situation, to affirm the quality of products the Tea Board supervises all steps in the process of manufacturing. The Cabinet of Ministers has given approval to a proposal made by Minister

of Plantation Industries Navin Dissanayake to introduce the IT backbone to improve efficiency of these tasks at an estimated cost of Rs. 220 million.

Source: <http://www.colombopage.com>

Sri Lanka to examine tea blending

The Government of Sri Lanka has appointed a committee to study the impact of blending tea for re-export in the country, a controversial issue that has dogged the industry for many years due to opposing views. The committee has been appointed by Prime Minister Ranil Wickremesinghe and would be headed by the National Policies and Economic Affairs Ministry Secretary M.I.M. Rafeek.

This stakeholder committee would look at developing a national policy on the aspect of tea blending in Sri Lanka. The committee will advise the government on whether blending tea in Sri Lanka could be allowed and if so on what conditions the import of such teas and blending for re-export could be carried out. Industry stakeholders would be consulted at every level and a comprehensive advisory document would thereafter be submitted to the PM who has also cautioned that there should be no negative impact to the industry whatsoever.

Source: <http://www.sundaytimes.lk>

Bangladesh sets up safe food courts

Bangladesh government has set up safe food courts in 64 districts. "The government will ensure food safety for the people. Food safety is people's constitutional right and the present government wants to guarantee this right," said Food

Minister Advocate Quamrul Islam. The food minister said, at present 201 food inspectors have been appointed and safe food courts set up in 64 districts, including metropolitan cities.

The government has given recognition to 10 laboratories for testing food, he said, adding that the Safe Food Authority will set up its own laboratories soon. He warned that none of those involved with food adulteration would be spared. Minister Quamrul Islam stressed the need for creating mass awareness over safe food for implementing the Food Safety Act, 2013.

Source: <http://www.thefinancialexpress-bd.com>

EU provides food safety training in Viet Nam

As a result of ever-increasing food trade between Viet Nam and the EU, sanitary and phytosanitary controls and food safety has become a critical issue. "It's important for the EU members to have uniform food standards in place for the protection of consumers against sanitary and phytosanitary hazards," said EU Commissioner for Agriculture and Rural Development Phil Hogan.

The training ensures harmonization of food safety control procedures between EU and Vietnamese partners and guarantees an equally competitive marketplace for food companies from both economies. Considering the Viet Nam, EU free trade agreement that is in the offing and most likely to come into force in 2018, it is imperative for Vietnamese companies to get up to speed, thoroughly understand and comply with the EU sanitary and phytosanitary regimes for food safety.

Source: <http://www.english.vov.vn>

India to upgrade food testing labs

Food Safety and Standards Authority of India (FSSAI) have announced a Rs 482-crore scheme to strengthen the food testing infrastructure in the country. "FSSAI has rolled out a major scheme for strengthening of Food Testing Infrastructure in the country at an estimated cost of Rs 482 crore, in the light of the recent observations by High Court, Mumbai, regarding the urgent need to upgrade food testing Laboratories in India," said FSSAI.

The empowered committee constituted for implementing this scheme on November 2. "Proposals from 7 States/UTs, namely, Goa, Delhi, Karnataka, Kerala, Madhya Pradesh, Tamil Nadu and Punjab were considered for strengthening their food Testing infrastructure. Two proposals, from Chandigarh (Punjab) and Calicut (Kerala), were approved in principle," FSSAI said. The other states were requested to revise and resubmit their proposals according to the scheme guidelines with mentorship support from FSSAI.

The committee also approved the proposal for strengthening the referral food laboratory at Central Food Technology Research Institute (CFTRI) through provision of latest equipment and facilities. Introduction of these equipment facilities would enhance the testing capability of CFTRI for adulteration of honey and pesticide and antibiotic residues in food samples. Under this scheme, 45 State/UT food testing labs (at least one in each State/UT with a provision of two labs) and 14 referral food testing labs will be upgraded to obtain NABL accreditation.

Source: <http://www.economictimes.indiatimes.com>

China adopts strict food safety rules

China has set strict regulations on governing how food producers and operators – including related third-party computer platform and delivery service providers – store, market and transport their products sold online. Known as “Order 27,” the China Food and Drug Administration’s “Measures of the Investigation and Punishment of Illegal Conducts Concerning Online Food Safety” is designed to improve the safety of online food trading by enhancing transparency and accountability. Some of Order 27’s provisions specifically target food supplements and infant formula, products which Chinese food safety officials regard as particularly troublesome due to past problems.

Source: <http://www.foodsafetynews.com>

New standards for fortifying foods in India

The Food Safety and Standards Authority of India (FSSAI) has released new standards on fortification on food. The guidelines are meant to regulate the fortification of food, especially packaged food, with essential micronutrients to counter rising malnutrition in the country. Anupriya Patel, Minister of State for Health and Family Welfare, said that fortification of food is seen as a culturally acceptable method that can be introduced quickly and economically with significant advantages.

Patel added that the government, on its part, would ensure schemes such as Integrated Child Development Scheme, the midday meal scheme and public distribution system are mandated to buy and

distribute fortified food to end malnutrition. “Changing food patterns are seen as one of the leading causes of micronutrient deficiency in the country,” said Ashish Bahuguna, Chairman of FSSAI. Fortification of food is accepted as an efficient and economic way of reducing deficiency according to experts.

In India iodine-fortified salt has shown success in curbing incidents of deficiency related diseases such as hypothyroidism and goiter. Bahuguna said that while India has achieved success in boosting food production to the point that it is now an exporter of several food products, it has not been able to battle the hidden hunger of malnutrition. Fortification of commonly-eaten foods, in addition to encouraging balanced diets, would help the country fight this problem.

Source: <http://www.thehindubusinessline.com>

India’s draft on water-based beverages

The Food Safety and Standards Authority of India (FSSAI) has issued a draft amending Food Safety and Standards (Food Products Standards and Food Additives) Regulations, 2011 for beverages. It proposed new regulations for non-carbonated water-based beverages (non-alcoholic), citing its microbiological requirements.

“This draft on non-carbonated water-based beverages cannot come at a more perfect time. There are almost 50-100 new companies poised and in the pipeline to enter this market in the near future. This amendment will give them a lot of clarity on what rules they need to comply with for their product to enter the market soon,” said Ashwin Bhadri, at Equinox Labs.

The proposed regulations will be known as the Food Safety and Standards (Food Products Standards and Food Additives) Amendment Regulations, 2016. The draft defined non-carbonated water-based beverages (non-alcoholic) as, “Those beverages which contain water and conform to the standards prescribed for packaged drinking water under these regulations without added carbon dioxide and may contain any of the following, singly or in combination.”

Source: <http://www.fnbnews.com>

Shelf-life requirement for food imports in India

The Food Safety and Standards Authority of India (FSSAI) has issued new rules for importing products. Striving to deal with concerns over the entry of sub-standard products and simplify the process by setting shelf-life norms and relaxing labelling guidelines. The main clause, in line with the new rules, is that no food article will be permitted unless it has 60% shelf-life remaining on clearance from customs. The Food Safety and Standards (Import) Regulations, 2016, will come into effect when they are announced by publication in the Official Gazette, the FSSAI said.

Source: <http://www.fssaifoodlicense.com>

FOSCOLLAB

FOSCOLLAB is an online platform displaying data and information useful for food safety professionals.

For more information, access:

<http://www.who.int/foodsafety/databases/en/>

Rapid nanosensor for *E. coli*

Researchers at Pittsburg State University (PSU), the United States, have developed a new nanosensor to rapidly detect pathogenic strain of *E. coli* in order to help prevent foodborne disease. Conventional methods to screen food to find sickness-causing microbes can take as long as 24 hours, which is often too slow to efficiently catch tainted products before they hit store shelves.

Faster methods exist, but have limitations. Magnetic resonance, for example, can detect extremely low levels of bacteria, but loses its effectiveness at higher bacteria concentrations. Fluorescence is the opposite. The researchers developed a hybrid nanosensor incorporating magnetic resonance and fluorescence. Lab testing of milk showed the detector could sense varying concentrations of the pathogenic strain of *E. coli* O157:H7 in less than an hour.

They also used their sensor to analyze *E. coli* levels in untreated lake water, which serves as a source of household water in some developing areas. "Additionally, the device could be customized to detect a wide range of pathogens beyond *E. coli*," said Tuhina Banerjee, Santimukul Santra, at PSU. The study has appeared in the journal *ACS Infectious Diseases*.

Source: <http://www.qualityassurancemag.com>

Antimicrobial coatings

According to a new study done Dr. Qiumin Ma and colleagues at the University of Tennessee, the United States, applying antimicrobial coatings to whole cantaloupes during storage significantly reduces contamination by

pathogenic bacteria, and has the potential to improve their microbiological safety and extend their shelf-life. Chitosan-based coatings significantly inhibited the growth of *E[scherichia] coli* O157:H7, *L[isteria] monocytogenes* and *S[almonella] enterica* cocktails on whole cantaloupes during 14-day storage at ambient temperature (21°C).

Coatings also significantly reduced total mold and yeast counts on whole cantaloupes. Cantaloupes are particularly susceptible to microbial contamination because they grow on the ground and can therefore come into contact with foodborne-pathogens associated with polluted irrigation water, uncomposted manure, or animal droppings. They can also become contaminated during harvesting, handling, and preparation. The rough cantaloupe skin also allows bacteria to easily attach to the surface of the fruit.

Researchers investigated the efficacy of antimicrobial coatings in reducing bacterial populations from the surface of cantaloupes. In addition, they investigated two generally-recognized-as-safe antimicrobials-lauric arginate (LAE; which inhibits a broad spectrum of foodborne pathogens) and cinnamon oil (CO; an essential oil that has shown activity against *Listeria* species, gram negative bacteria, *E. coli* O157:H7, and *Salmonella* species). They also investigated ethylenediaminetetraacetic acid (EDTA; an agent that chelates divalent calcium ions that are important to bacterial structures; it also enhances the activity of some antimicrobials).

Source: <http://www.contagionlive.com>

Salmonella reduced by 90%

Researchers at the University of Nevada, the United States, are focusing on an old technology that uses natural bacteria predators, called 'bacteriophages'. The technique is being used to reduce salmonella bacteria in meat products. "We were able to reduce salmonella by as much as 90% in ground poultry, ground pork and ground beef. We're excited to show such good results, food safety is an important part of our work and salmonella is one of the most prevalent bacteria in the nation's food supply," said Amilton de Mello, at the University of Nevada.

De Mello's research treated meat products infected with four types of salmonella by applying Myoviridae bacteriophages during mixing. Bacteriophages are commonly found in our environment. They are viruses that can only harm specific bacterial cells and are harmless to humans, animals and plants. In the experiments, the salmonella bacteria was inoculated on refrigerated meat and poultry trim, then the treatment was applied to the meat before grinding. The bacteriophages invaded the cells of the bacteria and destroyed them.

Source: <http://www.qualityassurancemag.com>

Method to detect harmful bacteria in food

Scientists at Pittsburg State University (PSU), the United States, have developed a method that quickly detects the presence of dangerous bacteria in food and water. "If we can have a scanner that could tell me if this food is contaminated, then we wouldn't

eat it,” said Tuhina Banerjee, at PSU. The project – a collaboration among Banerjee; Santimukul Santra and James McAfee, faculty members; and six students – combined magnetic resonance imaging, also known as MRI technology, and fluorescence to detect harmful bacteria in food and water.

The PSU team combined the two techniques to develop a hybrid sensor that could sense concentrations of O157:H7, a strain of *E. coli* that can cause severe illness, in less than an hour. “The tremendous advance about this is it’s quick, and you can count theoretically down to one cell – which is, I’m hesitant to say, a first, but maybe a first,” said McAfee. And the device is not limited to *E. coli*. It could be applied to test for other illness-inducing pathogens such as salmonella or the bacteria that lead to cholera.

The next step, will be to collaborate with engineers and others who can help turn the new technology into a chip device that consumers could use to know quickly whether the food or water in front of them is contaminated with bacteria. Banerjee said that project could take much more research and time, but the end result would be worth it. A summary of their research has been published in the journal *American Chemical Society*

Source: <http://www.joplinglobe.com>

Food freshness technology

Bridgewater State University (BSU), the United States, has reported the results from its test of a new food freshness technology. Nature’s Frequencies’ Food Freshness Card is a 15 cm² laminated card programmed with electromagnetic waves and frequencies that are designed to

delay the growth of mould (fungi) and bacteria that can feed on and decompose food.

Suitable to use in a refrigerator, in a bread box or under a fruit bowl, the Food Freshness Card lasts as long as the laminated hologram remains intact – approximately one year – and assists in keeping many foods fresher provided they are within 1.2 m of the card. The Food Freshness Card is also suitable for shipping containers, walk-in commercial refrigerators, produce markets and anywhere food is stored.

BSU tested the Food Freshness Card throughout its food services department, with 36 cards placed in storage areas, walk-in refrigerators and serving areas. According to the university’s executive chef: “Since the 36 Food Freshness Cards have been installed throughout our facility, we have not seen any mould on our bread, allowing us to not dispose of any bread. The first month’s savings of bread waste alone (\$274) represents about a 6% savings on our bread purchases.”

Source: <http://www.foodprocessing.com.au>

Detecting harmful bacteria in food products

Researchers at Purdue University, the United States, have engineered a bacteriophage called NanoLuc – a virus that only infects bacteria – to produce an enzyme that causes *E. coli* O157:H7 to emit light if infected. The process can shave hours off traditional testing methods, which can be critical when stopping the distribution of tainted foods. “It’s really practical. They (testing labs) don’t have to modify anything they’re

doing. They just have to add the phage during the enrichment step of the testing protocol,” said Bruce Applegate, at Purdue.

While many strains of *E. coli* bacteria are harmless, some can cause severe and potentially fatal illnesses. Ingesting as few as 10 colony-forming units of *E. coli* O157:H7 can result in serious illness. Current detection methods cannot find just a few *E. coli* O157:H7 cells in a sample, so inspectors do an enrichment process, culturing the bacteria to multiply so they can be detected. With the bacteriophage added to the sample, scientists can add a reagent and detect *E. coli* O157:H7 before the enrichment process is even finished, within seven to nine hours.

“The current detection methods cannot bypass the enrichment process, but our technology can explore the enrichment phase. That can give us a time advantage over other methods,” said Dandan Zhang, at Purdue. The process is also unlikely to create a false positive because the bacteriophage cannot produce the light-emitting protein without encountering *E. coli* O157:H7, which is the only bacteria NanoLuc is able to infect. “The phage is just a virus. It cannot carry out metabolism until it infects a bacteria, which in this case is *E. coli* O157:H7,” said Applegate.

Source: <https://www.eurekalert.org>

Codex Pesticides Residues in Food Online Database

This database contains information on Codex Maximum Residue Limits (MRLs) and Codex Extraneous Maximum Residue Limits (EMRLs) both for pesticide / commodity combinations.

For more information, access: <http://www.codexalimentarius.net>

Milk chocolates to get healthier

Researchers from the North Carolina State University (NCSU), the United States, have developed a method to use peanut skin extracts to make milk chocolate that has even more nutritional benefits of dark chocolate without affecting the taste. They extracted phenolic compounds from peanut skins – a waste product of peanut production – and encapsulated them into maltodextrin powder which is an edible carbohydrate with a slightly sweet flavor that comes from starchy foods such as potatoes, rice or wheat.

The maltodextrin powder was incorporated into the milk chocolate. “If applied to commercial products, peanut skin extracts would allow consumers to enjoy mild tasting products and have exposure to compounds that have proven health benefits,” said Lisa L. Dean from NCSU. Including these extracts would allow for a value-added use of the discarded skins, because peanut skins are a waste product of the blanching process of the peanut industry.

Consumer testing of 80 subjects who compared samples of both milk chocolates with peanut extracts and without showed that the fortified chocolates were liked as well as the untreated milk chocolate. These tests also showed that the threshold for detecting the presence of the peanut skin extract was higher than that needed to fortify the milk chocolate to antioxidant levels comparable to dark chocolate.

Source: <http://www.food.ndtv.com>

Device lets grow food from plant cells

Researchers at the Technical Research Centre of Finland (VTT) have invented an appliance that grows food ingredients – basically, all the healthy compounds found within veggies – using plant cells inside a bioreactor. The team says the system, known as the CellPod, works by growing plant cell material from a seed culture, producing proteins, fibres, and other plant-based compounds, to give the user the benefits of a greenhouse on their kitchen counter – no farm required.

“Urbanisation and the environmental burden caused by agriculture are creating the need to develop new ways of producing food – CellPod is one of them. It may soon offer consumers a new and exciting way of producing local food in their own homes,” said Lauri Reuter, at VTT. Instead of growing entire plants, like traditional gardening and farming does, the CellPod works by growing undifferentiated plant cells, creating enough plant matter to be harvested about once a week.

In other words, the CellPod allows people to grow the ‘good stuff’ inside plants – the healthy compounds – without the need for cultivating an entire tree, shrub, or seedling. “These cells contain the plant’s entire genetic potential, so they are capable of producing the same healthy compounds – such as antioxidants and vitamins – as the whole plant. The nutritional value of a cloudberry cell culture, for example, is similar to or even better than that of the berry itself,” the team said.

Source: <http://www.sciencealert.com>

Reducing diabetes with barley grains

A researcher at Faculty of Agricultural, Life & Environmental Sciences (ALES), University of Alberta, Canada, has commercialized a more cost-efficient way of getting beta glucan from barley grains. The new product, called Cerabeta™, is a concentrated dietary fibre enriched in beta glucan. Since February, it’s been produced in a grain processing plant in Camrose, where automation methods are being perfected. “The product is currently sold in bulk; plans are to sell it via Internet channels and in grocery stores next year,” said Thava Vasanthan, at ALES.

Beta glucan is a soluble dietary fibre ingredient that exists in oat and barley grains. Scientists have long known that it is excellent for slowing rates of starch digestion and glucose absorption into the bloodstream, which is good for diabetics who can’t tolerate a glucose overload. It also traps bile acids produced from cholesterol and excretes them, so regular consumption of beta glucan brings down blood cholesterol levels. In addition to helping manage diabetes and high cholesterol, the natural and gentle mechanism of beta glucan creates none of the side-effects that medical drugs can.

These health benefits are already fully recognized and its health claims approved by the U.S. Food and Drug Administration (FDA), Health Canada and the European Food Safety Authority (EFSA). Now, Vasanthan has perfected a new extraction method using air currents to separate the fibre from the grain, which substantially lowered the production cost. That makes it highly appealing to food producers who can easily add it to breads, breakfast cereals,

nutrition bars, snack foods, smoothies and even yogurts.

Source: <http://www.afns.ualberta.ca>

Success with healthier food processes

EU-funded researchers have identified effective ways for food-makers to reduce the salt, sugar and fat content of popular products without losing out on taste. Their success has already led to a range of new products hitting the market, with others in the pipeline. The EU-funded TERIFIQ project sought to address this challenge by testing and eventually bringing to market processing strategies to reduce fat, sugar and salt. A key element has been identifying measures that can be easily adopted by small firms.

Foods developed using TERIFIQ technology have been commercialised (semi-hard cheeses, Chorizo and dry sausages have already hit the shelves) while others are a step or two away from being brought to market. The results demonstrate that nutritious yet tasty foods are possible, and present a key market opportunity for small European businesses which represent over 98% of the continent's food manufacturing sector. The TERIFIQ project focused on four key food sectors: dairy, meat, bakery and ready-to-eat products.

To begin with, several strategies for reducing salt, fat and sugar were explored, with particular emphasis on achieving binary reductions (salt-fat and sugar-fat, for example). Fat, sugar and salt are not just about taste; they also play a key role in the consistency, mouthfeel, aroma and shelf-life of a product. This is a major challenge to food-makers, because any changes in the concentration or substitution of

these ingredients affects a whole range of properties, such as texture and flavour perception.

Source: <http://www.ec.europa.eu>

Natural pigments and useful raw materials

VTT Technical Research Centre of Finland is developing leaf-processing technologies, which could be used by the cosmetics, textile and feed and food industries. In a process developed by VTT, leaves gathered in gardens and parks are dried and ground, and compounds are extracted. The processing stages were developed by VTT in laboratory experiments; R&D has now entered the piloting stage, using leaf material collected in the Otaniemi area by waste disposal company Lassila & Tikanoja.

Special attention has been paid to the environmental friendliness of the overall process and the safety of the compounds produced. "In laboratory experiments, we discovered several, promising alternative ways of utilising leaves. Piloting assays are under way, in which we are examining how our methods work in practice and what quantities of valuable compounds can be extracted from the leaves," said Liisa Nohynek, at VTT. Pigments from autumn leaves can be used to colour cosmetics and textiles.

The chemical composition of leaves varies largely between different tree species. Added value can be obtained by processing the autumn leaves of certain tree types only, thereby producing well-defined compounds suitable for new products. Residual biomass, which is remaining after extraction, is high in nutrients and suitable for soil improvement in home gardens. On the other hand, this waste can also be further pro-

cessed to compounds that inhibit the growth of harmful microbes, thus being suitable e.g. for cosmetic and hygiene products.

Source: <http://www.phys.org>

Stevia molecules unchanged by processing

A research study conducted by scientist Dr. Ursula Wölwer-Rieck at the University of Bonn, Germany, has supported stevia's claim to naturality, finding that all the plant's sweet molecules remain unchanged throughout the stages of processing. During the study Dr. Wölwer-Rieck used analytical techniques such as high-performance liquid chromatography (HPLC) in combination with C18 and/or hydrophilic interaction liquid chromatography (HILIC) columns to separate, identify and quantify the individual steviol glycoside molecules.

The study found all nine of the steviol glycoside molecules required by the specifications set by the Joint Expert Committee on Food Additives (JECFA), a committee jointly administered by the Food and Agriculture Organization (FAO) of the United Nations and the World Health Organization (WHO), were present and unchanged in dried stevia leaf, through the commercial extraction and purification process and in the final stevia leaf extract product.

"Finding the same nine steviol glycoside molecules unchanged in the stevia leaf, the water extract and in the final product confirms that the commercial extraction and purification process of high-purity stevia leaf extract does not alter the sweet steviol glycoside molecules in the leaf," said Dr. Wölwer-Rieck.

Source: <http://www.foodprocessing.com.au>

Research backs corrugated benefits

A new research by the University of Bologna's Department of Agricultural Food Sciences, Italy, has shown how corrugated fibres trap and stifle microorganisms. This new research is the second study from the team. The first investigated the exchange of microorganisms between packaging and fruit and proved this cross-contamination is more extensive in returnable plastic crates (RPCs) than corrugated packaging, packing fruit in both materials and then tracking the cell loads of the target microorganisms in various circumstances.

Building upon the results of the previous study, this investigation looked at the reasons for the difference in cross-contamination levels between RPCs and corrugated packaging. The team discovered that the higher levels of packed produce cross-contamination in RPCs were due to microorganisms surviving longer on plastic surfaces than corrugated. The researchers introduced both spoilage microorganisms – which affect shelf-life and quality of fruit – and pathogenic microorganisms – which can cause foodborne disease – onto corrugated and plastic surfaces and took samples at regular intervals.

While the level of microorganisms decreased over time on both packaging materials, the fall was significantly faster on corrugated compared to the plastic crate samples. The study then explored why microorganisms perished more rapidly on corrugated surfaces than on plastic ones. Their work revealed how microorganisms get absorbed and trapped in the corrugated fibres, then die there from lack of nutrients and water. The RPC samples, however, showed an impenetrable surface incapable of entrapping

microorganisms and reducing the superficial contamination.

Source: <http://www.fruitnet.com>

Nanoparticle based edible coating

Researchers at UNAM, National Autonomous University of Mexico, have developed an edible coating to extend the life of vegetables and fruits and preserve them for prolonged refrigeration. This coating with added purposeful ingredients could be applied to freshly cut foods. Dr. Maria de la Luz Zambrano Zaragoza, at the Faculty of Higher Cuautitlán (FES), explained that the advantages range from having a cut fruit attractive, “by oxidation, many fruits no longer consumed with this technology, crop losses will decrease also retain nutrients from fruits or vegetables”.

Using a university developed technology, cut up apple could be preserved up to 25 days and a kiwi for two weeks. But their production is expensive – it costs 70 pesos a liter of dispersion to coat 20 kg of cut fruit to be placed in convenience stores and consumed later. After nine years of research, researchers have discovered that if nanocapsules filled with alpha tocopherol and beta-carotene in fresh-cut vegetables and fruits are dispersed, homogeneous film develops, which inhibits enzymatic browning and extends the life of these foods.

The coating cannot be visibly seen due to immersion method applied to the fruit surface and the active substances are absorbed, leaving the product ready to eat. Additionally, coatings with a variety of flavors can be developed in order to make the product appealing. Scientific development already patented and secured first place in the “Development Program Patenting and

Innovation” awards. The purpose is to boost a culture of industrial property at UNAM. Following this, researchers aspire to develop a pilot plant for industrial production.

Source: <http://www.azonano.com>

Making food and flowers last longer

Researchers at Curtin University, Australia, has come up with a way of extending the shelf-life of vegetables, fruit and flowers by slowing down the process that leads to them spoiling. The process has the potential to help reduce the billions of tonnes of food that are wasted worldwide each year. In effect, it also represents a new weapon in the fight to help feed the world's growing population, estimated to reach more than nine billion people by 2050. Making food last longer and reducing waste will help feed more people, compared to alternative strategies of having to increase food production.

The process was developed by Zora Singh and Dr. Alan Payne. Food and flowers ripen, and then over ripen and spoil, due to their natural production of ethylene gas. The researchers have come up with compounds they've dubbed 'ethylene antagonists' (in chemistry an antagonist is a substance which inhibits another process). The result is that fruit and vegetables stay fresher for longer, and cut flowers take longer to drop their petals. “The way these compounds work is that they don't reduce the production of ethylene, they prevent the fruits, vegetables and flowers from perceiving ethylene,” said Dr Payne.

Prof Singh up to 44 per cent of fresh food and produce spoils before it reaches consumers, and that half of this is due to ethylene production. Professor Singh has been working in the food research area

for more than two decades and several years ago approached Dr Payne. The pair says their ethylene blockers are more versatile than current methods and can be used pre- or post-harvest as a solid or liquid by spraying, dipping, waxing or fumigation.

Source: <http://www.phys.org>

Natural clean label shelf-life extender

Arjuna Natural Extracts Ltd., India, has launched X-tend, its natural preservatives range that keeps food fresh and increases shelf-life. X-tend addresses three major food trends: natural, clean label and food safety. Arjuna opened a new food technology division at the company's Cochin R&D facilities in the south of India's Kerala State to serve food and beverage companies in addition to its established nutraceuticals clients. The new line consists of distinctive formulations of proprietary blends of essential oils and oleoresins.

Arjuna's R&D team identified a unique selection of botanical extracts possessing antimicrobial activity and comprehensively tested them in multiple food and beverage applications. The sensory profiles indicated no change in taste or mouthfeel. Arjuna's R&D team developed a range of natural preservatives that do not change the organoleptic properties of food and beverage products such as bread, yoghurt, cheese sausage, humus, mayonnaise and vegetable oils, fruit juices, and fruit pulp.

The company's ingredient scientists combine herbal extracts used in traditional medicine with methods of fermentation for bacteriocins, in concert with advanced technologies, such as microencapsulation and emulsification. Arjuna's natural antimicrobial system is made from

a combination of natural antifungal and antibacterial components isolated from spices, herbs and bacteriocins. They are targeted specifically to address the spoilage issue in fresh foods and beverages, and improve shelf-life naturally. *Contact: Arjuna Natural Extracts Ltd. E-mail: benny@arjunanatural.com.*

Source: <http://www.pnnewswire.com>

Keeping fruit fresher for longer

At Curtin University in Western Australia, horticultural researcher Professor Zora Singh and organic chemist Dr Alan Payne have devised new compounds called ethylene antagonists which slow down the process that leads to spoiling. The researchers believe that it has the potential to substantially reduce the billions of tonnes of food wasted every year because of spoilage. "I started to think how could I make a compound that is easier to make, easier to use and I came up with these compounds that Zora was happy to test on fruits," says Dr Payne. "The way these compounds work is that they don't reduce the production of ethylene, they prevent the fruits and vegetables from perceiving ethylene. Every fruit has a receptor that ethylene binds to. What we're doing is we're masking those receptors. "The beauty of these compounds is that we can apply them in the production phase, and they are more user friendly," adds Professor Singh.

The duo claim their ethylene antagonists are extremely versatile and can be used in a variety of ways; before and after harvesting as a solid or liquid, dipping, waxing and fumigation. The ethylene antagonists are created in the form of solids and liquids, ensuring they can be easily used at any point in the production process.

They are said to be most effective when applied prior to the beginning of the ripening process. Although the compounds are environmentally friendly, they are not registered to be used in organic produce.

These new ethylene antagonists are said to be suitable for a wide range of fruits and vegetables including apples, nectarines, plums, tomatoes, bananas, pears, papaya, mangoes, peaches, apricots, oranges, lemons, limes, grapefruit, tangerines, kiwi fruit, pineapple, persimmons, avocados, melons, berries, cherries, most leafy green vegetables such as lettuce, spinach, cabbage, vegetables such as carrots and potatoes, onions, garlic, asparagus, sweetcorn, broccoli, peas and herbs such as basil and oregano.

An additional advantage possessed by the new ethylene antagonists is the fact that they can allow producers to control the rate of development in the fields, thus protecting from plant stresses. Zora and Payne say that, "Ethylene is not only a ripening hormone but is also involved in plant developmental and stress responses. As these compounds block ethylene action, they retard development of flower and leaf abscission and have the potential to alleviate ethylene-mediated stress responses."

The discovery of ethylene antagonists has already won Payne & Singh a Curtin University Commercial Innovation Award and a patent has been filed, while potential partners to commercialise the technology are now being sought.

Source: <http://www.producebusinessuk.com>

Eucheuma-based healthy beverages

Food scientists at National University of Singapore (NUS) have developed the eucheuma-based packaged beverages with no added sugar and preservatives with YGC Group, Singapore. Eucheuma, a category of edible red seaweed mostly grows in Southeast Asia. Eucheuma is high in crude protein, dietary fibre, omega-3 fatty acid, vitamin C and minerals. It has properties of both seafood and vegetables.

Regular consumption of eucheuma will help improve body functions, including promoting healthy digestion and preventing colon cancer and cardiovascular diseases. It can also lower blood pressure, cholesterol and glucose levels and promote brain development, anti-aging and help tissue repair. A research team led by Prof YANG Hongshun at NUS, has developed the eucheuma-based beverages with no added sugar, preservative-free. The sweetness comes from natural honey or fruit or herbal extracts. No preservatives are needed for this beverage.

Furthermore, the team applied proper food grade hydrocolloids to evenly distribute the ingredients in the beverage system, which makes it appealing to consumers. With the input from a team of food science and technology students, NUS researchers and YGC Group, more new products have been developed: osmanthus honey eucheuma drink and orange eucheuma drink. Prof Yang was awarded a 'certification of appreciation' from the company in 2015 for his contribution to the company's research and development.

Source: <http://www.science.nus.edu.sg>

Affordable solutions for fruit drinks

DuPont Nutrition & Health, the United States, has launched a new range of GRINDSTED® JU Systems for the South Asian market. The new development comes in light of the FSSAI notice dated 24 Dec 2015, which allows use of various other hydrocolloids – permitted singly or in-combination in non-carbonated water-based flavored drinks, including punches and ades. The new GRINDSTED® system blends, JU 543 and JU 4801 offers cost-in-use advantage over existing solutions in the market with a comparable mouthfeel and viscosity.

These are also 'ambient soluble stabilizers' which translates to easy handling, just right for the Indian topography. GRINDSTED® JU Systems harness the power of synergy between various hydrocolloids, offering improved mouthfeel and better suspension at low concentrations, thus providing significant cost savings. The JU System solutions are tailor made to provide optimum stability and viscosity in RTS fruit beverages. They are easy to apply, helping improve production efficiency.

"GRINDSTED® JU Systems have been designed with DuPont's expertise in beverage applications. These newly launched products have the right combination of hydrocolloids offering optimum functionality for texture, viscosity, and stability" said Karuna Jayakrishna, senior application specialist, DuPont Nutrition & Health.

Source: <http://www.danisco.com>

New way to increase antioxidants in coffee

According to a study done by Washington State University, the

United States, researchers found that adding a small amount of Chardonnay grape seed pomace (GSP), a waste stream of wine production, to coffee may augment the antioxidant capacity of the beverage without significantly altering the appearance, taste or aroma. Researchers conducted two consumer panels to assess the acceptance of coffee with additions of GSP values of 0% (control), 6.25%, 12.50%, 18.75% or 25%.

The first consumer panel assessed the coffee samples served "black." The second panel assessed the coffee samples with sweeteners, milk and cream options available. Consumer sensory evaluation involved evaluating the five treatments individually for acceptance of appearance, aroma, taste/ flavor, and overall acceptance using a 9-point hedonic scale. A check-all-that-apply questionnaire surveyed the sensory attributes describing aroma, appearance, and taste/ flavor of the samples.

Oxygen radical absorbance capacity was used to measure the effects of antioxidant levels in GSP coffee samples. The researchers found that GSP could be added at 6.25% replacement without significantly affecting the overall consumer acceptance of coffee compared to the control. Above 6.25% GSP supplementation, the coffee beverage was described as more tan, milky, watery/dilute, and mild, and was generally less accepted by the consumers. GSP also increased the antioxidant capacity of the coffee compared to the control (0% GSP), with no significant differences among replacement values.

Source: <https://www.eurekalert.org>

Fruit-based carbonated drinks

Country's premier food technology laboratory, CSIR-CFTRI (Council of Scientific and Industrial Research-Central Food Technological Research Institute), India, have developed carbonated beverages which will be soon available in the markets. The CFTRI has created standardised carbonated drinks based on grape, pomegranate, sweet lime, sugarcane and neera (coconut palm sap) flavours, which have the potential for commercial production. Carbonated fruit juices are generally formulated with 20% natural fruit juices in them.

Some beverage manufacturers have evinced interest in commercialising the CFTRI's fizzy fruit juice formulations, promoted as 'healthy' and 'nutritious' drinks suitable for all age groups, and particularly suited to the carbonated preferences of the younger generation of consumers. The CFTRI proposes that plant nutrients-based carbonated fruit juices can be healthier alternatives to synthetic carbonated beverages, and they give better returns to farmers by opening new marketing avenues for them.

Source: <http://www.thehindu.com>

Sensors to control the quality of beverages

Spanish researchers have developed a low-cost, easy-to-implement and flexible optical sensor that provides great advantages compared to other optical devices. Within a project of the BBVA Foundation Grants for Researchers and Cultural Creators 2015, researchers from Universidad Politécnica de Madrid (UPM), Spain, have developed an innovative optical sensor using a conventional tape since it is a low-cost and flexible material that can be easily acquired at stationery

shops and it can detect variations of the optical properties of a liquid when is immersed in such liquid. The developed sensor can be used to control both the quality of beverages and environmental monitoring.

The sensor consists of a waveguide using a piece of tape where light from a LED is introduced in one of its end and the light that comes out from the other end is detected through a photodiode. The light coupling to the flexible waveguide is possible thanks to a diffractive element, using a grating with aluminum lines of nano dimensions which is added to the tape through a simple process of "tear and paste". Both ends of the waveguide can be easily adhered to the emitter (LED) and the light detector (photodiode).

Because of the flexibility of the tape, the waveguide can bend and is partially immersed in the liquid under examination. Due to the waveguide bending, part of the propagated light is lost by radiation. This curvature loss depends on the optical properties, in particular the refractive index, of the surrounding medium, in this case the liquid in which the waveguide is introduced. Thus, it is possible to detect variations of the refractive index of the liquid by measuring with the photodiode the optical power lost during the path of light through the immersed waveguide.

The refractive index of a liquid solution is related to its both physical and chemical properties such as density and concentration. Thus, we can assess, for example, the maturation degree of the grape by measuring the refractive index of its juice or the alcoholic content of certain beverages. In this way, the developed sensor can be applied to the food sector (process control and beverage quality) and the environmental sector (water quality control). The materials and com-

ponents used to develop this sensor are common and inexpensive. Besides, the assembly of the three main components of the sensor: waveguide, LED and photodiode, is simple and there is no need of instrumentation or specialized tools, therefore the assembly can be carried out by non-qualified personnel.

Source: <http://www.upm.es>

Functional drink from all natural ingredients

A team of researchers from University of Connecticut, the United States and University of Exeter, the United Kingdom, applied nanotechnology to formulate a novel functional drink from all natural food ingredients and a complete formulation of nutrients, including both hydrophilic and hydrophobic vitamins as well as mineral salts, was developed. Peppermint oil dissolved in propylene glycol together with fat-soluble vitamins was first emulsified in aqueous phase with sodium caseinate as natural emulsifier to obtain nanoe-mulsion. Then pectin was coated to sodium caseinate to form nanocomplex particles, via electro-deposition induced by pH adjustment and heating treatment.

The formulations were systematically optimized in terms of various physicochemical properties, including particle size, polydispersity index, and zeta potential. The optimal formulations, which were prepared at pH 4.5, exhibited the particle size around 250 nm with PDI < 0.25, and the zeta potential of -22 mV. The functional drink was able to retain the antioxidant activity of encapsulated nutrients during storage at both refrigeration and room temperature for up to 15 days.

Source: <https://www.researchgate.net>

New packaging solution extends shelf-life

Food service and packaging products provider CKF Inc., Canada, has manufactured 'Earthcycle™' pulp fibre trays, which are food grade trays that are recyclable, renewable and certified compostable to the BPI standard. The trays are also suitable for home compost environments. The Earthcycle trays support brands and retailers that want to show their consumers that they care about the environment.

From the color, the look and feel of the material, through to its independently verified environmental credentials, Earthcycle products substantiate claims for environmental stewardship. Such trays are a perfect match for use with Xtend® modified atmosphere packaging. The prolonged shelf-life achieved with the use of Xtend and Earthcycle, reduces the carbon footprint in instances where it allows customers to use sea instead of air freight for distribution. Extended shelf-life also helps reduce waste in the supply chain.

For some time now, Xtend has been used, together with Earthcycle trays, for green asparagus, supplied to Trader Joe's by Gourmet Trading. Not only is this a very attractive display, but it couples compostable trays with shelf-life extension technology. "In the three plus years that we have supported this program, we have had only compliments from both the grower and the retailer on the freshness of the product and the ease of packing" said Shannon Boase, at CKF. The asparagus has a shelf-life of 28 days when packed with Xtend and Earthcycle.

Source: <http://www.freshplaza.com>

New avocado packaging technology

ROP Ltd, Israel, has developed a technology that uses controlled levels of gas and humidity that obviates the need to use 1-MCP or similar substances and extends storage life beyond current standards without it. Currently, avocado's ready to eat stage is very brief resulting in it either being sold unripe or having a short shelf-life. ROP's new technology has doubled its ready to eat stage to up to six days or more.

Furthermore in this ROP solution – Since ready to eat Avocado is so tricky, customers tend to feel the fruit, which bruises it. Hence, many retailers have started to pack ready to eat Avocado in trays. "When fruit is put on the shelves fresh, the special protective trays will no longer be necessary because customers will learn that the fruit is ready to eat and need not be handled. This will prevent damage resulting by waste as well as will economize on packaging," said Mr. Gal Wallach, at ROP.

This new development could greatly affect global consumption, since avocado is one of the most abundant fruits in the world – it is big business. In the United States, consumption in 2014 exceeded 4 billion avocados, four times the number eaten at the start of the new millennium.

Source: <http://www.israelagri.com>

Novel oxygen absorbing package

Kirtiraj Kundlik Gaikwad, an Indian scientist with the Department of Packaging, has been awarded the prestigious IAFP Young scientist scholarship award for his research work on "development of novel

oxygen absorbing package in the field of active packaging for oxygen sensitive food products". The award was presented in the annual meeting of International Association of Food Protection (IAFP) held by The IAFP Foundation, USA. Its purpose was to encourage young outstanding food safety scientist from all over the world.

Kirtiraj developed novel oxygen scavenging package from the natural source. The feature of this package is it can extend the shelf-life of food also it is suitable for microwave, liquid food packaging like juices, and metal detector friendly at processing line. The IAFP recognizes young researchers from around the world that are the future leaders in the field of food safety. The IAFP Foundation has been dedicated to enhancing the career potential of exceptional researchers through the annual IAFP Scholarship Program.

Source: <http://www.timesofindia.indiatimes.com>

Biscuit-on-edge packaging system

Bosch Packaging Technology, Germany, has developed a biscuit-on-edge packaging system, for biscuits and crackers in slug packs. The modular system consists of a loader, a transfer unit, a feeder and the Pack 301 LS (Length Slug) horizontal flow wrapper. The system, which includes a Smart Measuring Loader for slug portioning, has been designed to provide gentle product handling for delicate and brittle biscuit-type products, even at higher speeds, as the loader allows for smooth placement of the portioned biscuits into the cross chain.

To keep the biscuits in an upright position while being transported

into the film tube, the biscuit portion is supported by a counter holding pin. Between the folding box and the cross-sealing station the slug is guided by side belts or chains towards the cross-sealing station. The narrow design of the cutting head improves sealing performance and creates tight seals. The system can be accessed from all sides for fast and easy cleaning and maintenance.

Machine parts in contact with the product are made of stainless steel, and the open design allows crumbs and rejected products to fall through or be removed easily. The system allows quick format changes, and when a product is missing, the machine and the infeed stop to avoid empty packages. The system can package rectangular, square and round products, as well as sandwich biscuits, and can be equipped with up to 10 vibratory channels. The modular design allows for scalable solutions and layout flexibility.

Source: <http://www.foodprocessing.com.au>

Packaging solution for tea industry

Packaging specialist Teepack, Germany, has developed the latest version of the Perfecta Flowpack, an all-in-one solution for the tea industry. The new version of the machine that produces and packages high-quality, double-chamber tea bags features an optional unit for nitrogen gassing. This tried-and-tested technology for preserving processed food ingredients makes the new packaging solution especially suited for delicate green tea.

Most types of tea – especially green tea – have sensitive flavours, but the processed tea leaves readily react with oxygen, leading to an ageing process that

causes them to lose their distinctive aroma. Gassing the tea leaves with nitrogen naturally reduces the oxygen, allowing the tea to be hermetically packaged to stay fresh longer without losing its flavour or texture.

The Perfecta Flowpack produces tea bags with a string and tag, and then hermetically seals them using heat-sealing technology. Thanks to its integrated flowpack unit, the machine can wrap ten or more filled tea bags in a sealed foil. By integrating all the functions in a single machine, Teepack's Perfecta Flowpack provides a highly efficient all-in-one solution, which saves both time and space and so lowers the total costs of ownership.

Source: <http://www.fnbnews.com>

Banana packaging for extended shelf-life

The RipeLock Quality System from AgroFresh, the United States, can deliver bananas with a wider window of freshness to retailers and consumers. The technology is proven to help retailers keep bananas at the optimal selling color on display, and cut down on shrink. The system combines a laser micro-perforated modified atmosphere packaging bag and 1-methylcyclopropene (1-MCP) formulation.

The RipeLock system starts when the grower harvests green bananas and places them into special bags that maintain the ideal environment for bananas during shipment. After arrival at the destination, the bananas are prepared for market at a ripening facility. During that period, the RipeLock liner slows ripening to ensure the highest-quality products reach the store for sale to consumers.

The technology enhances the banana's natural ripening process to maintain fruit color, taste and texture to extend freshness significantly longer than traditionally ripened bananas, Frye said in the release. The longer shelf-life also gives retailers the ability to have consistent fruit on display longer. RipeLock also reduces the need to air stack boxes in most back-room environments.

Source: <http://www.thepacker.com>

Researchers produce edible nano packaging

Researchers at University of Tehran, Iran, have developed a kind of nano packaging that is edible in addition to being highly biodegradable. Milad Rouhi, the project manager, referred to edible films as one of the most important components in biodegradable packaging, adding "synthetic polymer-based biofilms are usually stronger, more maintainable and have more functions than the natural type."

Rouhi added, "among synthetic polymers, the hydrophilic types due to the use of polar solvents, are cheaper and less hazardous, and create less environmental pollution. Furthermore, these types of polymers are usually edible and have higher biodegradability." Adding a specific amount of nano-crystalline cellulose and correction of the polymer structure will cause significant improvement in mechanical, thermal and durability properties of the biofilm.

Source: <http://www.en.mehrnews.com>

Packaging cooling solution

Industrial cooling solutions provider Aqua Cooling, the United Kingdom, has developed and installed a new future-proof chiller system for Anson Packaging's manufacturing plant near Ely, Cambridgeshire, England. Anson Packaging, the United Kingdom, is a provider of packaging to the foodservice market and is a part of multinational Faerch Plast Group, Denmark, which manufactures food-to-go packaging.

The new highly efficient packaging cooling system is designed by utilizing glycol-free free-cooling and magnetically-driven centrifugal compressor chillers. As part of contract awarded earlier, Aqua delivered two 700kW and two 800kW air-cooled, thermosyphon free-cooling Turbocor units working on R134a refrigerant for the Anson site.

Designed to spread the cooling load while ensuring optimum cooling and ultra-high efficiency levels, the system features full built-in redundancy. It also allows free cooling to be achieved in a higher ambient temperature than normal. Additionally, the Turbocor solution is claimed to be 60% more efficient when compared with traditional compressors that have integrated free cooling.

Source: <http://www.machineryand-equipment.packaging-business-review.com>

Stretch blow moulder

KHS, Germany, has developed modules for special packaging formats for its InnoPET Blomax Series IV stretch blow molder. The preferential heating system (PH) enables bottlers to achieve bottle

quality even with oval bottles via an energy-saving and safe process. During preferential heating, the preform is selectively heated according to its later bottle shape to prevent any uneven distribution of materials.

Preferential heating is made possible by a special heater section at the end of the heating segment. Here, the system first rotates the PET preforms through the heater to obtain a basic heating profile. In the downstream PH section rotation is stopped, giving the preform its selective heating profile. The company has also developed a heater box to suit the wide-neck preforms used for various types of food packaging, such as PET packaging with 70 mm necks.

The heater box requires little heating energy and, when the containers are changed over, no manual conversion is needed. The TriBlock is a filling and packaging system for PET bottles that incorporates a stretch blow moulder, labeller and filler. With consistent neck handling, the system also enables lightweight PET to be processed.

Source: <http://www.foodprocessing.com.au>

Integrated solution for liquid and viscous food

Bosch Packaging Technology, Germany, has developed a new integrated system solution for liquid, viscous and pumpable foods. The new Certiwrap Elite wrap-around cartoner was developed in cooperation with Osgood, the United States, the manufacturer of fill and seal machinery for pre-formed containers, and Kliklok-Woodman, the United States, the provider of

vertical form, fill and seal (VFFS) machines and secondary packaging equipment.

Designed to meet the demand for containers in wrap-around cartons, the fill and seal equipment can reduce downtime for pre-made containers and is 3-A Sanitary Standards (3-A SSI) compliant. "One of the key benefits of being a part of the Bosch Group, is the ability to mix and match primary and secondary packaging offerings to create truly unique solutions, which answer specific market and consumer needs," said Janet Darnley, at Kliklok-Woodman.

Capable of ensuring accurate filling at speeds of up to 1,000 containers per minute, the new system allows liquid food manufacturers to reduce material waste. Claimed to be ideal for liquid and viscous foods in cups, or other rigid containers, the Certiwrap Elite is designed to offer an economical secondary packaging solution by using less paperboard material. When integrated with the Osgood S-series fill and seal machine, the Certiwrap Elite wrap-around cartoner offers a complete system solution for North American liquid food producers.

Source: <http://www.machineryand-equipment.packaging-business-review.com>

Capacity Building on Food Safety Standards in ASEAN Countries

The FAO regional project aims to strengthen capacities of ASEAN countries in contributing to Codex standards setting and implementing the adopted Codex standards.

For more information, access: <http://foodsafetyasiapacific.net>

Global regulatory guide on soft drinks and fruit juices

Focused on soft drinks and fruit juices from more than 50 countries this user-friendly guide provides a valuable single source on compositional requirements plus general information on how food additives and flavourings in soft drinks and fruit juices are regulated and an overview of labelling requirements.

Contact: *Leatherhead Food Research, 48-49 St James's Street, London, SW1A 1JT, UK. Tel: +44-207-014-3250; E-mail: help@leatherheadfood.com*

Light Scattering Technology for Food Property, Quality and Safety Assessment

The book discusses the development and application of various light scattering techniques for measuring the structural and rheological properties of food, evaluating composition and quality attributes, and detecting pathogens in food.

Food Processing Technologies: Impact on Product Attributes

The book covers a wide area from conventional thermal processing to emerging thermal and non-thermal food processing technologies and also presents in-depth information about changes in bioactive ingredients, shelf-life, and sensory attributes of food due to processing.

For the above two publications, contact: *CRC Press. Tel: +44-0-1235-400524; Fax: +44-0-1235-400525; E-mail: tandf@bookpoint.co.uk*

Biotechnology in Flavor Production

This book covers many of the biotechnological approaches currently being applied to flavor enhancement. Chapters discuss recent developments in the flavor modification of wine, beer, and dairy products through the manipulation of the microbial species involved. Biotechnological approaches to the production of specific flavor molecules in microbes and plant tissue cultures, and the challenges that have been encountered, are also covered.

Contact: *John Wiley & Sons Singapore Pte. Ltd., 1 Fusionopolis Walk, #07-01 Solaris South Tower, Singapore 138628. Tel: +65-6643-8333; Fax: +65-6643-8397; E-mail: csd_ord@wiley.com*

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