



VATIS UPDATE

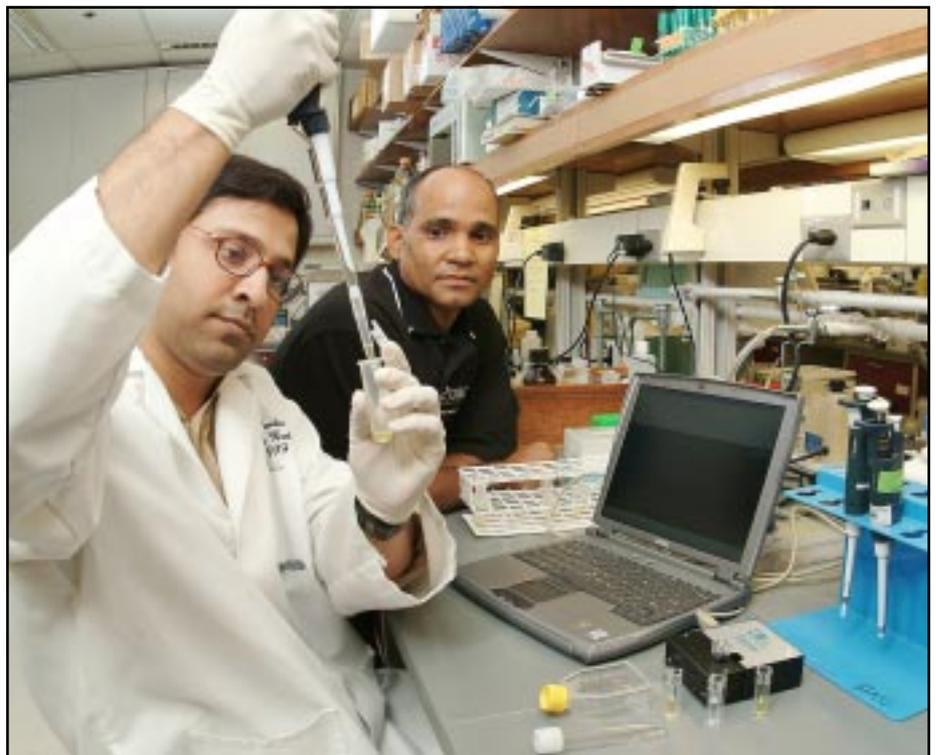
Food Processing

Vol. 3 No. 91 • Sep - Oct 2008

ISSN 0971-5649

Highlights

- 'Edible optics' for safer food
- Trendy new food ingredients
- Citrus extract: world's first natural preservative?
- Bergamot waste as juice additive
- New film provides low-temperature sealing
- Wet-mix process systems



APCTT

ASIAN AND PACIFIC CENTRE FOR TRANSFER OF TECHNOLOGY

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

A novel and simple biosensor for rapid detection of several food-borne pathogens and toxins
(Credit: Purdue University, USA)

CONTENTS

Vol. 3 No. 91

Sep - Oct 2008

**VATIS* Update
Food Processing**
is published 6 times a year to keep the readers up to date of most of the relevant and latest technological developments and events in the field of Food Processing. The Update is tailored to policy-makers, industries and technology transfer intermediaries.

Website: <http://www.techmonitor.net>

Editorial Board
Dr. Krishnamurthy Ramanathan
Mr. Nanjundappa Srinivasan
Dr. Satyabrata Sahu

**ASIAN AND PACIFIC CENTRE
FOR TRANSFER OF TECHNOLOGY**
Adjoining Technology Bhawan
Qutab Institutional Area
Post Box No. 4575
New Delhi 110 016, India
Tel: (91) (11) 2696 6509
Fax: (91) (11) 2685 6274
E-mail: postmaster@apctt.org
Website: <http://www.apctt.org>

The designation employed and the presentation of material in the publication do not imply the endorsement of any product, process or manufacturer by APCTT

This publication has been issued without formal editing

* Value Added Technology
Information Service

IN THE NEWS	4
Farm, seafood exports surge in Republic of Korea ✓ Abattoirs in India to be modernized ✓ Talks on food law in Fiji ✓ Food safety measure in Hong Kong ✓ Problems dog Vietnamese seafood industry ✓ Move to boost value and variety of Thai food exports ✓ Philippine processors go into non-traditional fruit products ✓ Sri Lankan tea exporters push to transform the industry ✓ Huge potential for SMEs in Malaysia's <i>halal</i> industry	
STANDARDS/REGULATIONS	6
Indonesia to get tough on food safety ✓ International standards for Philippine organic food certification system ✓ New pure food rules notified in Pakistan province ✓ China's food safety law focuses on small producers, stalls	
SAFETY/QUALITY CONTROL	8
'Edible optics' for safer food ✓ Low-energy X-ray system ✓ Lactic acid on-line analysis for dairy products ✓ Method for sanitizing leafy produce ✓ Laser combo improves product safety and quality ✓ New phage offers rapid <i>E. coli</i> detection in meat ✓ Low-cost texture analyser	
INGREDIENTS	10
Trendy new food ingredients ✓ New plant polysaccharide to enhance bread quality ✓ Sugar beet pectin shows encapsulation potential ✓ Magnesium ingredient targets beverages market ✓ A new compound for natural sweetener ✓ Red colorant from spray-dried prickly pear juice ✓ Two new food ingredients	
PRESERVATION	13
Disinfection of packaging with UV specialty lamps ✓ Natural preservative for perishable products ✓ Shelf-life modelling of photosensitive beverages ✓ Citrus extract: world's first natural preservative? ✓ Raspberry seed extract boosts muesli shelf-life	
BEVERAGES	14
Bergamot waste as juice additive ✓ Enzyme designed for light beer brewing efficiency ✓ Low-calorie fruit/vegetable juice	
PACKAGING	15
Cinnamon-based packaging to prevent food spoilage ✓ New MAP film for meat ✓ VFFS packaging system for special bag formats ✓ New film provides low-temperature sealing ✓ Ovenable food packaging	
MACHINERY/EQUIPMENT	17
Robot for high-speed food processing ✓ Wet-mix process systems ✓ Simultaneous batching system ✓ Mini batch processors	
RECENT PUBLICATIONS	18
TECH EVENTS	18

IN THE NEWS

Farm, seafood exports surge in Republic of Korea

Fuelled by strong overseas demand for locally raised poultry, mushrooms and molluscs, farm and seafood exports of the Republic of Korea surged in the first four months of 2008. The Ministry for Food, Agriculture, Forestry and Fisheries said US\$1.35 billion worth of farm products and seafood were exported in that period, up 24.6 per cent from the year before. In all of last year, the country shipped US\$3.76 billion worth of agriculture and fisheries goods overseas. Exports of seafood outpaced farm goods by jumping 34.2 per cent year-on-year, totalling US\$479.7 million.

In the category of fresh agricultural goods – which covers vegetables, flowers, fruits, mushrooms, ginseng, poultry, pork and processed food – the Ministry reported gains of 17.9 per cent on an annual basis with exports worth US\$871.4 million. A Ministry official said exports to Russia and China increased 37.2 per cent and 40.3 per cent, respectively, from January through April, while those to Japan rose by 21.5 per cent. Shipments to the United States were up 14.7 per cent compared with the year before in the four-month period, he added. (Source: www.korea.net)

Abattoirs in India to be modernized

Mr. Subodh Kant Sahai, India's Minister of State for Food Processing Industries, said that in the 11th Five Year Plan his Ministry proposes to provide financial assistance to the tune of Rs 6.28 billion (US\$134.73 million) for modernization of abattoirs under the public-private participation mode for creating infrastructure facilities. Speaking at the International Livestock and Dairy Expo 2008, Mr. Sahai added that during the financial year 2007/08, Rs 37.7 million (US\$808,170) has been provided to 17 seafood processing units.

Livestock is an important segment of agricultural sector in India, the Minister pointed out. It contributes nearly 23 per cent of the agricultural gross domestic product of the country. India possesses

16 per cent of the world's cattle population, 57 per cent of buffalo and 20 per cent of the entire bovine population, and accounts for 14.2 per cent of the global milk production. In meat and meat processing sector, poultry meat is the fastest growing animal protein in India, with per capita consumption growing from 870 g in 2000 to about 1.68 kg in 2005. This is expected to grow up to 2 kg in 2009. The total processing capacity in India is over 1 million MT per year, of which only 40-50 per cent is utilized. (Source: pib.nic.in)

Talks on food law in Fiji

A major consultation process is under way at the Environmental Health Division of Fiji's Ministry of Health to finalize an important legislation affecting the health of Fiji's people. The consultation on the Food Safety Regulations 2008 involves all health inspectors from around the country and is aimed at strengthening a law addressing the country's food safety concerns. The consultants are studying the 173-page draft Food Safety Regulations 2008, which, on adoption by Cabinet, will determine the way forward for Fiji in terms of food standards and best practices.

The Ministry says that the Food Safety Regulations 2008 is aimed at protecting the health of the people of Fiji, guarding the consumer against deception, and acting as a watchdog for food quality. "It will establish minimum standards on food products, whether they are produced and processed in Fiji for domestic consumption or export, or food imported into the country," the Ministry says. The proposed regulations will scrutinize and also supervise standards practiced at all levels and spheres. (Source: fijidailypost.com)

Food safety measure in Hong Kong

This September, the Centre for Food Safety in Hong Kong will launch a pre-statutory voluntary registration scheme for importers and distributors of sugars, sweets and snacks. The move stems from the government plan to introduce a food safety bill to establish mandatory registration to identify food importers and distributors so that the Centre can trace the food source in case of any food safety incidents. From 1 September,

importers and distributors of sugars, sweets and snacks are encouraged to register with the Centre their business registration number, address and phone number, and the name of the person in charge. (Source: www.thestandard.com.hk)

Problems dog Vietnamese seafood industry

In the first seven months of the year, Viet Nam's seafood export turnover increased by 20 per cent year on year to US\$2.4 billion, according to the Viet Nam Association of Seafood Exporters and Processors (VASEP). Despite this impressive performance, however, some problems threaten to affect the industry. Many in the seafood industry warn that a shortage of capital, electricity and inputs may slacken the expected acceleration.

Deputy Prime Minister Mr. Hoang Trung Hai has ordered the State Bank to release capital to commercial banks to make available loans to seafood processors. Mr. Hai also required the Viet Nam Electricity Group (EVN) to guarantee a stable power supply for seafood processors. However, 30 processing plants in the south may not have enough raw materials to operate efficiently for the rest of the year because they are threatened by diseases, fisheries exhaust and fuel price hikes, according to the Ca Mau Department of Agriculture & Rural Development. Debts are preventing many catfish farms from re-starting operations, says the Ministry of Agriculture and Rural Development. About 20-30 per cent of fish breeders are folding up, said Mr. Pham Van Danh, President of the An Giang Association of Aquaculture and Processing. (Source: vietnamnews.vnagency.com.vn)

Move to boost value and variety of Thai food exports

Industry Minister Mr. Mingkwan Sangsuwan will be discussing the strategic direction of Thai food exports over the next three to five years with the Director of the National Food Institute, Mr. Yuthasak Suphasorn. The strategy aims to raise the value of Thai food by two to three times, focuses on product quality to meet the global demand, and promotes other food products of the country besides rice, cassava, and frozen poultry and shrimps. Some of the top Thai food products

include condiments and spices such as garlic, fish sauce, chicken sauce and other seasonings.

According to the National Food Institute, food exports earned Thailand 380 billion baht (US\$11.10 billion) during the first half of 2008, up 28 per cent year-on-year. Mr. Yuthasak said that earnings from the country's food exports would slow slightly in the second half of 2008, to 367 billion baht (US\$ 10.54 billion). However, total food products exports – including agricultural commodities, fish, meat, processed food and beverages – should reach 750 billion baht (US\$21.54 billion) this year, up 20 per cent from last year, he predicted. (Source: www.bangkokpost.com)

Philippine processors go into non-traditional fruit products

Fruit processors in Mindanao, the Philippines, are diversifying into non-traditional products to expand their domestic and foreign market reach. "The market is looking for good alternative fruit products, and processors are always on the lookout for buyers," said Mr. Mar Marantan, General Manager of Linkage Food Ventures Corporation.

Mindanao is now well-established as an exporter of fresh tropical fruit – mainly banana, pineapple and papaya – as well as banana chips and pineapple juice, and several processors are venturing into non-traditional dried, pureed and frozen fruit products. In 2007, the island-region shipped out more than 24 MT of dried mango, papaya and pineapple valued at approximately US\$1,150,000 to markets in the United States, United Kingdom, New Zealand and the United Arab Emirates. In the same year, Mindanao also exported about 2,250 MT of mango and other fruit juices worth approximately US\$1,261,600 to markets in the United States, Republic of Korea, Australia, Hong Kong and Japan. (Source: business.inquirer.net)

Sri Lankan tea exporters push to transform the industry

Tea exports – one of the highest foreign exchange earners for Sri Lanka – in 2007 exceeded the US\$1.2 billion mark, transforming the industry from the traditional bulk tea exports to marketing sophisticated value-added branded teas popularly

known as Pure Ceylon Tea in the international market. Currently, Sri Lankan tea exporters market branded teas and bulk tea in more than 145 countries, placing Sri Lanka in a higher echelon among the other global competitors. Sri Lankan tea processing and packaging plants conform to the highest international specifications achieving standards such as HACCP, 5S, 6 Sigma and ISO standards which assure the end customers of a high quality product. (Source: www.dailymirror.lk)

Huge potential for SMEs in Malaysia's *halal* industry

The global *halal* industry is huge and worth more than US\$500 billion. Realizing the importance of the industry, the Government of Malaysia has embarked on various initiatives to transform the country into a major global *halal* hub. The move has been further strengthened by the recognition that the Organization of the Islamic Conference (OIC) accorded to the nation's *halal* certification. The government hopes the OIC recognition could act as a key enabler to encourage more businesses to go *halal*.

As the industry evolves, many corporations and small and medium enterprises (SMEs) have begun showing great interest in this area. To fuel the growth of SMEs, the government in collaboration with Bank Negara introduced a myriad of incentives. It recently launched two financing facilities of up to M\$1.2 billion (US\$347.60 million) to help SMEs cope with the impact of higher costs. The M\$700 million (US\$202.75 million) SME Assistance Facility and the M\$500 million (US\$144.88 million) SME Modernization Facility are expected to help SMEs ride through the current higher food and raw material prices.

Malaysia's Halal Industry Development Corp. said one of the main problems facing this industry was capacity and advised SMEs to consolidate for easier access to financing. It also urged financial institutions to play a bigger role in financing the *halal* industry. HSBC Bank Malaysia is one of the banks supporting the government's move to develop Malaysia as a global *halal* hub. HSBC Bank has a complete range of Islamic banking products and an insurance company that could take care of its customers' needs. (Source: biz.thestar.com.my)

STANDARDS/REGULATIONS

Indonesia to get tough on food safety

Indonesia's Drug and Food Monitoring Agency (BPOM) and the Attorney General's Office (AGO) have said violations against food and drugs safety standards are "high-priority cases" that demand special treatment. BPOM Head of Investigations, Mr. Halim Nababan, said that the public could breathe a sigh of relief as the AGO would demand heavier punishments in cases taken to court. "Both the BPOM and the AGO made the decision because crimes against the safety of foodstuffs could endanger the lives of millions of people," Mr. Halim said during a discussion held by the Indonesian Institute of Sciences.

According to the BPOM, food and drugs safety violations include selling expired packaged food, unregistered imported food products, packaged food containing dangerous chemicals, as well as forging packaged food permits. In the past, such crimes lay under the jurisdiction of local prosecutor's offices and were categorized as petty crimes, resulting in lenient sentences, Mr. Halim said. "With the new categorization, violations against food safety will be treated similarly to crimes like corruption and money laundering that carry heavier punishments," he added. Any violation could now result in a penalty of up to five years' imprisonment and/or a fine of Rp 600 million (US\$65,500). He said the number of cases had reached into the thousands, but only dozens had gone to the court. Now, this too would change. (Source: old.thejakartapost.com)

International standards for Philippine organic food certification system

The Philippines has to align its organic certification system with the International Federation of Organic Agriculture Movement (IFOAM) accreditation if it has to capture a growing market for health food in Europe, the United States and Japan.

The Bureau of Agriculture and Fisheries Product Standards (BAFPS) has been designated by the Executive Order 481 to develop a standard for organic food in the country. The Organic Certification Centre of the Philippines, the only institution BAFPS has accredited for this function, is not recognized by international organic food certification systems. This compels the Philippines to make its accreditation system compliant particularly with the ISO 65, which is recognized as a certification for safe organic food, according to Mr. Pablito M. Villegas, an Organic Producers and Trade Association (OPTA) Trustee. "If we have an internationally recognized certification system, then we can export to Europe, the United States, Japan and Korea," he said.

At present, if a company in the United States or Japan, for example, wants to import organic food from the Philippines, then it will have to ask its country-based certification agency. This may be the United States National Organic Standards Board or the Japanese Agricultural System. "But this is very costly for us, imagine having to pay for the air fares of inspectors," said Mr. Villegas. OPTA is pushing for government's funding assistance for the harmonization of Philippines' organic certification with international standards. "Government should invest in because it should be treated as a public good," he said. "There is a social cost for our health and our dying soil," he added. (Source: www.zambotimes.com)

New pure food rules notified in Pakistan province

In Pakistan, the Government of Punjab province has notified pure food rules that are in line with the food safety measures adopted by the developed countries to eliminate sale of injurious and sub-standard edibles. Informing this at a press conference, the Chairman of the Chief Minister of Punjab's Task Force on Essential Items, Mr. S.A. Hameed, said that earlier rules impeded the authority of the regulators to check many currently prevalent malpractices.

The new Pure Food Rules 2007 would be applicable for all food processors from 20 August 2008, and manufacturers and processors had been given 30 days to conform to the new food standards. Mr. Hameed said that violation of the rules would

be punishable by 5-15 years of imprisonment and heavy fines ranging from Rs 500,000 to Rs 2.5 million (approx. US\$6,590-US\$32,930).

The Punjab Food Authority is being established to regulate the food trade, Mr. Hameed informed. A global standard food testing laboratory is also being established in Lahore at an expense of Rs 120 million. Mobile testing laboratories would be on the Punjab roads to check the quality of foods being offered for sales in the province. Under the new law, the cases for supply of sub-standard food items would be booked against the owners or sponsors of the producers instead of the workers. (Source: www.thenews.com.pk)

China's food safety law focuses on small producers, stalls

China's small food factories, once outside the regulatory system, might be subject to specific local controls as a draft law on food safety has urged local legislatures to draw up factory safety measures. "Provincial legislatures must take specific measures to manage the work of small food workshops and vendor stands," says the draft law. "Food problems occur frequently in small companies and workshops below the county level. However, it is not practical to impose the [national] approval system on all of them, nor is it appropriate to let them be," the Law Committee of the National People's Congress (NPC) said in a report at the fourth session of the 11th NPC Standing Committee. The committee advised local legislatures to impose specific measures to guarantee food safety, while ensuring employment and social stability.

The draft law, currently submitted for a second reading by the national legislature, also nails down specific mechanisms for food safety functions to avoid overlapping monitoring and inefficiency. The health authority under the State Council is responsible for general food safety coordination, such as evaluating risks, setting safety standards, releasing information and checking serious food safety cases. Local governments at or above county level are responsible for organizing regional food management, coping with emergencies and assessing the work of local food safety supervising organizations, according to the draft. (Source: news.xinhuanet.com)

SAFETY/ QUALITY CONTROL

'Edible optics' for safer food

In the Netherlands, scientists at Tufts University's School of Engineering have demonstrated that it is possible to design "living" optical elements that could enable an entirely new class of food safety sensors. These sensors would combine sophisticated nanoscale optics with biological readout functions, be biocompatible and biodegradable, and be manufactured and stored at room temperatures without use of toxic chemicals. The Tufts team used fibres from silkworms to develop the platform devices.

"Sophisticated optical devices that are mechanically robust yet fully biodegradable, biocompatible and implantable don't exist today," said Dr. Fiorenzo Omenetto, the principal investigator and associate professor of biomedical engineering. Such systems would greatly expand the use of current optical technologies in food quality. Silk proteins are natural and ideal for integrating optical and biological functions. They can be processed in water at ordinary temperatures and patterned on the nanoscale to generate a wide range of optical elements, including ultrathin films, thick films and nanoscale and large-diameter fibres. Silk proteins also offer excellent surface quality and transparency, which are prerequisites for high-quality optics, and they are mechanically robust.

Tufts scientists boiled cocoons of the *Bombyx mori* silkworm in a water solution and extracted the glue-like sericin proteins. The purified silk protein solution was poured onto negative moulds of ruled and holographic diffraction gratings with spacing as fine as 3,600 grooves/mm. The cast silk solution was air-dried to create solid fibroin silk films that were cured in water, dried and optically evaluated. A similar process was followed to create lenses, micro-lens arrays and holograms. Film thicknesses from 10 to 100 µm were characterized for transparency and optical quality.

The variety and quality of the optical elements compared favourably with conventional platforms and outperformed other commonly used biopoly-

mers. However, the most compelling feature of the platform is that the elements are prepared, processed and optimized in all-aqueous environments and at ambient temperature, say the Tufts scientists. This makes possible the inclusion of sensitive biological 'receptors' within the solution that stay active after the solution has hardened into a free-standing silk optical element.

The Tufts team embedded three very different biological agents in the silk solution: a protein (haemoglobin), an enzyme (horseradish peroxidase) and an organic pH indicator (phenol red). In the hardened silk optical element, all three agents maintained their activity for long periods when simply stored on a shelf. "We have optical devices embedded with enzymes that are still active after almost a year of storage at room temperature. This is amazing given that the same enzyme becomes inactive if forgotten and left unrefrigerated for a few days," said Dr. Omenetto. (Source: www.bakeryonline.com)

Low-energy X-ray system

The Danish company, Innospexion, says its low-energy, high-speed X-ray detection system, called Modulinspex, can increase process and packaging quality control through its image quality, reduced radiation level and compact design. The Modulinspex inspection system offers processors added value through the ability to detect small details (a resolution of 0.1 mm). These range from fish bones and gravel in grain and baked goods, to worms and snails in salad pouches, which traditional technology does not allow, said Mr. Jørgen Rheinlaender, Innospexion Managing Director. The system provides images of high contrast at speeds up to 500 mm per second, said Mr. Rheinlaender, while its low-energy operation enhances operator safety.

Mr. Rheinlaender claims that the detection system has successfully demonstrated the ability to detect any irregularities in the seals of plastic jars and pouches in trials, thus reducing the risk of bacterial contamination of produce. He adds that the stainless steel system can be tailored to a food processor's particular requirements, which can vary depending on the speed of their production line and the type and size of products being scanned. (Source: www.bakeryandsnacks.com)

Lactic acid on-line analysis for dairy products

Determination of lactic acid in milk and associated dairy products is an extremely common laboratory application and has key product quality control use in a modern dairy. However, the time taken to transfer the sample to the laboratory and wait for information regarding the lactic acid concentration can be considerable. The production process can be improved and accelerated by placing the analysis in the production area.

The ADI 2016 Titro Analyser, from Applikon Analytical BV, the Netherlands, is designed to bridge the gap between the process and the laboratory by carrying out the analysis on-line. The instrument will provide analysis for lactic acid at about 10 minute intervals and report data in the format required for total automated control. The ADI 2016 Titro Analyser, housed in an IP66 stainless steel cabinet, can be mounted within the process environment without further protection and can be hygienically cleaned and sterilized as with other process equipment. *Contact: Applikon Analytical B.V., On-line Analyser Division, De Brauwweg 13/ P.O. Box 149, 3100 AC Schiedam, The Netherlands. Tel: +31 (10) 298 3555; Fax: +31 (10) 437 9648; E-mail: analyzers@applikon.com.* (Source: www.processingtalk.com)

Method for sanitizing leafy produce

In the United States, Agricultural Research Service (ARS) scientists are studying new sanitizing methods to enhance the safety of leafy greens – a technology that may result in safer salads. Food technologist Mr. Yaguang Luo, with the ARS Produce Quality & Safety Laboratory, first focused on reformulating a new sanitizer that works better than chlorine as a wash-solution ingredient. Chlorine solutions have been used by the food industry to help control microbes on fresh-cut greens, such as lettuce, but chlorine doesn't eliminate all the organisms that can be present.

Mr. Luo has been collaborating with scientists at the University of Illinois to test combining the use of several sanitizers, including the new formulation, with ultrasound as a means to enhance

the efficiency of sanitization prior to bagging. They conducted a study to determine the effects of selected sanitizer ingredients, with or without ultrasound, on the reduction of *Escherichia coli* populations on spinach. The best *E. coli* reduction was 4.5 logs, meaning the bacteria decreased from about 300,000 cfu to less than 10 cfu. This reduction was achieved through combining the newly formulated wash solution treatment with ultrasound treatment. The combination of a new sanitizer with ultrasound can potentially be used to enhance the microbial safety of leafy green produce before the bagging process, according to Mr. Luo. (Source: www.ars.usda.gov)

Laser combo improves product safety and quality

A new combination of lasers with colour cameras, from Key Technology in the United States, is claimed to achieve superior product quality and food safety. An extension of the company's Raptor Laser line, the laser combination is reported to increase sensitivity for detecting the presence of foreign material as well as product defects in both processed and fresh-cut vegetables, such as shredded and chopped lettuce, leafy salad mix, cabbage, and cut vegetables.

The combination is also claimed to improve performance across a wide range of vegetables, thereby removing the need to change or add laser modules. The new multi-sensor sorters are integrated with Key's proprietary colour cameras, and detect defects – such as extraneous vegetable matter and foreign material – by analysing differences in the structural properties of the objects, and differing levels of chlorophyll, colour, size and shape. The new combination uses multiple wavelengths simultaneously and enhances production versatility and can handle difficult sorts.

The supporting KeyWare Application Pack can process the data. The software is designed specifically for each application and the product being sorted in order to optimize the sorter's image processing algorithms. Processors can change between products via a touch-screen control panel. The KeyWare also eases the initial product setup, which therefore reduces the skill level required to operate at optimal performance. (Source: www.foodqualitynews.com)

New phage offers rapid *E. coli* detection in meat

The French company BioMérieux, a supplier of diagnostic systems, said that its new phage recombinant protein, Vidas UP, was developed by German group Profos AG and is highly sensitive and specific towards *E. coli* 0157:H7. The bacteriophage – viruses that target bacteria – is suitable for testing meat samples and is the latest in the Vidas line, which is an automated system for food borne pathogen detection within food service laboratories. “Vidas UP offers faster and more precise detection of *E. coli* 0157:H7 than molecular methods, delivering test results within seven hours, and is capable of analysing sample sizes up to 375 grams,” said a company spokesperson. (Source: www.foodqualitynews.com)

Low-cost texture analyser

CT3 Texture Analyser, a new easy-to-operate texture tool from Brookfield Engineering Inc. in the United States, is claimed to be a cost-effective way for processors to measure the texture of food products as well as their packaging. The texture analyser can be used with food products such as butter and cheese products, sauces, snack foods, baked goods, fruits, meat products, confectionery and puddings.

The major advantages of the CT3 are its low cost, ease of use and dual mode capability, said Mr. Bob McGregor, Brookfield’s Marketing Manager. “The operator can be running tests with only five minutes of training in stand-alone mode. This is ideal for quality control purposes in busy food production environments,” he added. He claims the design of CT3 is a significant enhancement over the previous model, the LFRA, as it works in both compression and tension modes, and gives a five-load range to suit processors of all sizes.

The CT3 is a compact unit that fits easily into existing plant environments and has an easy-to-read display as well as intuitive controls. It can also pull items apart when operating in tension mode, making it suitable for use with packaging. The CT3 costs under US\$10,000, as compared with other typical texture analysers that have a price tag of around US\$25,000, said Mr. McGregor. (Source: www.bakeryandsnacks.com)

INGREDIENTS

Trendy new food ingredients

Mr. Patrick Mannion of Innova Market Insight, while speaking at the recent Food Ingredients Africa conference in Cape Town, South Africa, said product developers are under pressure to remove or significantly reduce trans-fats, high fructose corn syrup and salt in processed foods. Consumers are also pressurizing processors to assist them in fighting obesity and diabetes.

Many food ingredients and flavour houses have already introduced innovative ingredients to reduce sodium levels, cut trans-fats, offer alternative sources of fibre and protein, and increase satiety. Mr. Mannion says the Innova database tracked 1,375 products launched in 2007 which claimed to be low-salt or low-sodium – 43 per cent more than in the previous year. These include: Oriola’s Pansalt; Cargill’s SaltWise; Lactosalt Optitaste from Armor Proteines; Maxarome Select from DSM Food Specialities; Symrise’s Taste for Life; Jungbunzlauer’s Sub4salt; and SaltTrim from Wild Flavours.

Ingredients manufacturers have developed various products to address the acrylamide problem, which include Purac’s Puracal ACT that permits up to 70 per cent reduction of acrylamide, and Novozymes’ Acrylaway that can reduce acrylamide by up to 90 per cent. Suppliers of conjugated linoleic acid (CLA) – a nutrient that has many reported health benefits such as building muscle, promoting fat loss, and helps with healthy glucose and insulin metabolism – include Cognis and Lipid Nutrition: 89 per cent of them are supplements.

Alternative proteins and dietary fibres are the other areas of interest. Novel potato-derived ingredients are expected to see strong demand from food producers, which are currently facing soaring raw material costs. For instance, Solanic has produced a potato protein that can be used to replace gelatine or egg white in certain gel applications. CNI has turned its attention to alternative sources of dietary fibre. Its Equacia uses a range of co-processed ingredients based on two all-natural dietary fibres – acacia gum (soluble) and wheat fibre (insoluble).

Among ingredients that target trans-fats, Loders Crocklaan claims its Couva 850 NH is the first non-hydrogenated, non-temper, non-lauric coating fat, and that it contains greater levels of nutritionally positive cis-monosaturated and polyunsaturated fatty acids than alternative coating fats. ADM says that its NovaLipid range of oils and fats solutions enables food manufacturers to offer nutritionally balanced foods. Danisco's Grindsted Crystallizer emulsifier blends improve the crystallisation speed and performance of non-hydrogenated and trans-free fats. (Source: www.developoptechnology.co.za)

New plant polysaccharide to enhance bread quality

Researchers at the CAS Changchun Institute of Applied Chemistry, China, have worked out a new plant polysaccharide, as an ideal substitute for potassium bromate in making bread more edible. The new plant polysaccharide has a tubular microstructure capable of forming a thin coating. When mixed with dough, it wraps up the dough, trapping air in the bread when baking, which makes bread soft with evenly distributed pores. The novel plant polysaccharide makes an important substitute for potassium bromate, as it produces neither toxins nor side-effects. The technology can also be applied to produce other convenient foods, replacing traditional chemicals and additives, with a quality up to food safety standards. (Source: www.most.gov.cn)

Sugar beet pectin shows encapsulation potential

Using sugar beet pectin to coat proteins could lead to the formation of core-shell systems for use as encapsulators or fat replacers, suggests new research. The new study prepared core-shell biopolymer particles that could be used to encapsulate, protect and deliver functional ingredients such as nutraceuticals, proteins, fibres or lipids according to lead researcher Dr. D. Julian McClements from the Department of Food Science at the University of Massachusetts (UM) in the United States.

The particles may be useful in: mimicking light scattering by fat droplets to make cloudy systems that could be applied to beverages; texture,

viscosity and mouthfeel modification delivery systems; and encapsulation, protection and delivery of functional components. The researchers write, "The biopolymer particles produced using the above-mentioned approach would be assembled entirely from food grade ingredients (proteins and dietary fibres) using simple processing operations (mixing and pH adjustment). Consequently, they could be economically produced by the food industry on a large scale."

The researchers, affiliated with UM and Mahidol University in Thailand, electrostatically deposited sugar beet pectin onto a heat-denatured beta-lactoglobulin protein. Stable core-shell biopolymer particles were formed by mixing a suspension of protein aggregates with the sugar beet pectin at pH 7, and then adjusting the pH to below 6 where the pectin is adsorbed. The particles were found to be stable over the pH range of 4 to 7, but aggregating in more acidic conditions. The particles did not clump together in salt concentrations less than 250 millimoles at pH 4, as they had good salt stability. (Source: www.ap-foodtechnology.com)

Magnesium ingredient targets beverages market

Israeli supplier Gadot Biochemical has launched a stable-dispersion magnesium citrate blend that can be used in soy beverages to boost levels of a vital nutrient. Called Gadamag K, the ingredient seeks to provide magnesium fortification options for soy drinks, smoothies, infant formula, milk drinks and milk substitutes. The ingredient is also being marketed for its ability to prevent kidney stones and to meet standard Recommended Daily Amount (RDA) requirements, especially in soy drinks and vegetarian infant formulas.

Mr. Ronny Hacham, Gadot's vice president of business development and marketing, said the patented ingredient that had "excellent dispersion" in liquids, a hurdle many mineral offerings fail to overcome. The ingredient does not coagulate with other ingredients in typical beverage formulations. This has been achieved without the use of traditional stabilizers such hydrocolloids that are typical in such ingredients, Mr. Hacham said. Gadamag K contains 10 per cent of elemental magnesium and 10 per cent of elemental potassium. (Source: www.beveragedaily.com)

A new compound for natural sweetener

The German ingredients company Nutrinova, in collaboration with the Biotechnology Research and Information Network (BRAIN), has identified compounds that could yield new natural sweeteners for the food and beverage industry. No indication has been given as to the source of these natural compounds. However patent applications have been filed for both the screening technologies used and the compounds uncovered. Nutrinova president Mr. Eckart von Haefen said the company's next step will be to conduct further evaluation of the substances, and preparing to get them ready for the market. Nutrinova is already credited with the sweetener Acesulfame K, a potassium salt, which it sells under the brand Sunett. (Source: www.bakeryandsnacks.com)

Red colorant from spray-dried prickly pear juice

A new study has devised an optimal process for spray-drying the juice of prickly pear (*Opuntia stricta*), so that it can be used as a natural red food colouring in yoghurts and soft drinks. The fruit juice of prickly pear is a source of betacyanin pigments, which can be used as a natural food colorant. Plants of the *Opuntia* species may present a better source of red colour over red beet, report Dr. Jose Maria Oban and colleagues from the Universidad Politecnica de Cartagena in Spain. They represent a lower risk of microbiological contamination, have no nitrate content, are very flavoured, and are also rich in nutrients like calcium, magnesium, vitamin C and quercetin. The liquid colouring from the fruit has a high colour strength, low viscosity and high storage stability.

The new study aimed at presenting a method to obtain a powder colorant from same fruit juices by spray drying. The optimum conditions for the *O. stricta* fruit juice were seen to be: juice content of 20 per cent by volume and concentration of 1.2° Brix; glucose syrup as a drying aid with at a content of 10 per cent weight by volume, liquid feed rate of 0.72 litres/hour, air spray flow-rate of 0.47 m³/hour, drying air flow rate of 36 m³/hour, and inlet drying temperature of 160°C. The result was a powder with a colour strength of 4.0,

stable when stored at room temperature for one month. The same stability was noticed in two actual food products tested: a yoghurt and a soft drink.

The same team of researchers had earlier noted that fermenting the fruit juice of *O. stricta* could produce concentrated betalains for use as food colouring. The technique yielded pigment recovery of 85.5 per cent, much higher than the 56-65 per cent reported for red beet juices. The team tried three strains of micro-organisms, and found *Saccharomyces cerevisiae* var. *bayanus* AWRI 796 to produce optimal results. A temperature of 35°C produced the best results in terms of sugar consumption and pigment preservation. After this fermentation step, centrifugation separated out the biomass, while the rest was concentrated under vacuum. (Source: www.confectionerynews.com)

Two new food ingredients

The Fisheries Research Institute (FRI) of the Council of Agriculture in Taiwan, China, has developed two food ingredients based on algae extracts that proved effective in mitigating metabolic syndrome by controlling blood pressure levels and blood fat. The ingredients are Fuso-trehalose – a sugar that exists in algae, mushrooms, beans and shrimp – and an instant agar.

Dr. Wu Chun-heng, Director of the FRI's Seafood Technology Division, said that besides moderating blood pressure and lipid level, Fuso-trehalose also enhances human immune system's defence mechanism against pathogens. Fuso-trehalose can be used as a food ingredient because its chemical structure can survive even in environments of 121°C for 30 minutes or 100°C for one hour, the temperatures and times usually used for food sterilization.

In the case of instant agar, Dr. Wu said that the products currently available on the market are neither easy to cook nor were they very portable; thus the FRI scientists came up with the idea of making instant noodle-like agar products. These products contain agar powder that can be brewed with hot water at 85°C. FRI researchers said that dietary fibre-laced instant agar could be used as meal replacements for patients with metabolic syndrome or persons who wish to control their weight. (Source: www.taipeitimes.com)

PRESERVATION

Disinfection of packaging with UV specialty lamps

Food manufacturers are increasingly choosing disinfection with ultraviolet light (UV) as a cost-effective and environment-friendly alternative to conventional chemical processes. Short-wave UV-C radiation, in particular, has an intensive effect: micro-organisms such as viruses, bacteria and fungal spores are destroyed by UV radiation in a matter of seconds.

UV disinfection modules from Heraeus Noblelight GmbH, Germany, can be installed into existing filling machinery for dairy and beverage products. BlueLight UV disinfection modules are custom-built for the treatment of packaging and surfaces. Various shapes and sizes of containers for dairy products – as well as lids, sealing and packaging foils – can be disinfected with UV radiation. UV disinfection inactivates up to 99.99 per cent of total germs without slowing down the machinery.

The UV modules are also suitable for combination treatment with UV and hydrogen peroxide. The powerful systems produce cold UV radiation, disinfecting packaging material without heat. The compact design makes it easy to retrofit BlueLight UV disinfection modules into existing plants. *Contact: Heraeus Noblelight GmbH, Heraeusstraße 12-14, D-63450 Hanau, Germany. Tel: +49 (6181) 35 9966; Fax: +49 (6181) 35 9926; E-mail: hng-disinfection@heraeus.com.* (Source: www.innovations-report.com)

Natural preservative for perishable products

Ms. Monika Barbara Horgan and The IAMS Company, the United States, have jointly patented a natural preservative system for perishable food compositions, particularly pet foods. The preservative system comprises natural preservatives containing secondary metabolites, selected from the group consisting of green tea, oolong tea, black tea, annatto seed, bixin, grape seed, grape seed extract, rosemary extract, sage extract, oregano extract, cocoa, fruit and vegetable extracts.

The composition is meant to be complete and nutritionally balanced, with the flavonoid phytochemical compounds contained therein acting to promote health. (Source: www.freepatentsonline.com)

Shelf-life modelling of photosensitive beverages

Researchers from the Department of Food Science of Udine University, Italy, have developed a new approach to shelf-life modelling of photosensitive foods. They exposed a saffron-containing yellow beverage, which was highly prone to oxidative photobleaching, to different light levels at increasing temperatures. During exposure, samples were analysed for bleaching rate, pigment content and pigment degradation products. The results obtained clearly demonstrated that shelf life testing of light-sensitive foods must take into proper account the effect of light.

According to the researchers, for photosensitive foods, shelf-life models based solely on the accelerating effect of temperature may be misleading. Hence, they concomitantly used the accelerating effects of both light and temperature to develop and validate a simple model correctly predicting the shelf life of the beverage under actual storage conditions. The methodology proposed may allow solving of the difficult task of predicting shelf life of photosensitive foods marketed. *Contact: Ms. Lara Manzocco, Dipartimento di Scienze degli Alimenti, Università di Udine, via Sondrio 2, 33100 Udine, Italy.* (Source: pubs.acs.org)

Citrus extract: world's first natural preservative?

Israeli company Citramed has developed a method to extract all the antibacterial properties found in the rind of citrus fruit, for use as a preservative in health products and the food industry. Citramed has filed a patent for more than 80 possible uses, which includes preservation of cosmetics. Applications are based on the company's active ingredient "CPE", which has been found to protect humans, animals and plants against a wide variety of bacteria, fungi and yeast. The citrus peel has a natural defence mechanism that protects its fruit against micro-organism attack, says Mr. Lior Rosental, the former CEO of Citramed.

Citramed developed a way, which uses a simple water-based process to enhance the citrus peel's effectiveness.

Citramed projects the CPE as an alternative to parabens, cosmetic preservatives that have been reported to be harmful to human health. The company has proven its extract can be developed for commercial purposes on an industrial scale, and hopes to first apply its compound immediately in both food and cosmetics industries. (Source: www.mfa.gov.il)

Raspberry seed extract boosts muesli shelf-life

Extracts from raspberry seeds may protect components of muesli from oxidation, and prevent the development of off-flavours, according to new research. Scientists from the August Cieszkowski Agricultural University of Poznan in Poland report that the seed extract prevented the oxidation of lipids, and could extend the shelf-life of the breakfast food.

The health components of muesli include ingredients such as nuts that are rich in omega-3 fatty acids. "However, the higher lipid content in muesli and the composition of fatty acids make these products very susceptible to lipid oxidation," say the researchers Dr. Dorota Klensporf and Dr. Henryk Jelen. "Lipid autoxidation leads to the formation of hydroperoxides, which decompose to secondary oxidation products, such as aldehydes, ketones, alcohols and furans. These compounds are associated with changes in the odour and flavour."

The researchers prepared a mixture of wheat flakes, oat flakes, corn flakes, hazelnuts, raisins, sunflower seeds, and flax seeds with and without the raspberry seed extract. The lab-made muesli was then subjected to accelerated storage tests at 60°C. Using a variety of analytical techniques, the researchers observed that the raspberry seed extract inhibited lipid oxidation, with a third the quantity of volatiles and hexanal as the control muesli after 14 days. The flavour dilution factor values – a measure of levels of odour-active products of lipid oxidation products – were lower in the muesli prepared with the raspberry seed extract. (Source: www.foodnavigator-usa.com)

BEVERAGES

Bergamot waste as juice additive

Bergamot (*Citrus bergamia*) is a natural hybrid of bitter orange and lemon, grown almost exclusively in the Calabria region of Southern Italy. While the essential oil of bergamot is used by the pharmaceutical, cosmetics industries and food industries, the bitter-tasting juice is considered a waste product. Ms. Rita Pernice and colleagues from the University of Naples, Italy, now report that bergamot juice could actually be used to fortify other commonly consumed fruit juices with additional flavonoids and to prevent thermal degradation of ascorbic acid during processing.

The researchers first identified the phenolic pattern of bergamot juice. Analyses showed the presence of narirutin, naringin, isorhoifolin, rhoifolin, rutin, neoponcirin, hesperidin and neodiosmin. Next, the team tested the bergamot juice in a real food system, using a traditional industrial recipe to make fruit juice from apples and apricots on a laboratory scale. They also made variants that contained 10 and 20 per cent bergamot juice, both together with and replacing synthetic ascorbic acid and citric acid.

The juices were tested throughout the production process and after storage at 37°C for 15 days. "All the results obtained support the hypothesis that the addition of bergamot juice to juices preserves their ascorbic acid content from thermal degradation and contributes to enhance the antioxidant activity, ensuring a product much richer in antioxidants and ascorbic acid," Ms. Pernice reported. The bergamot had a better effect on preserving ascorbic acid after thermal treatment and storage than the synthetic additives – may be due to the bioactive compounds, the bergamot polyphenols in particular.

The study tried out juices enhanced with bergamot with consumers, and found that the fortified juices ranked quite highly in terms of colour and visual viscosity (5.2-6.8 and 5.1-6.5, respectively, on a scale of 1-10). However, while the 10 per cent bergamot juice was acceptable in taste (4.3 to 6.6), the 20 per cent juice was too astringent or bitter. (Source: www.ap-foodtechnology.com)

Enzyme designed for light beer brewing efficiency

A new brewing enzyme can improve cost efficiency within the production of light beers, says its manufacturer. Novozymes, a Denmark-based world leader in bio-innovation, claims that the all-in-one design of its Attenuzyme Flex can reduce dosage of products and the time needed to break down malts during the brewing process, particularly for the production of low-calorie beers.

According to Novozymes, the product combines a blend of enzyme activities in a single product, which work to assist the amylase present in malts to break down starch into fermentable sugars over a much shorter time span. Novozymes' single dosage enzyme was designed to offer production benefits for lighter products, says Mr. Soren Lund, Regional Marketing Manager, brewery operations.

Mr. Lund says that by using Attenuzyme Flex in the beer making process, brewers can shorten the production or 'mashing' time for highly attenuated light beers to the same amount of time needed for producing regular beers. High levels of attenuation, the process in which sugars are consumed by yeast, is a time-consuming part of producing lighter beers. (Source: www.beveragedaily.com)

Low-calorie fruit/vegetable juice

Procter & Gamble, the United States, has been assigned a European patent on an efficient process for separating and recovering aroma and flavour volatiles from fruit or vegetable juices and for lowering the amount of sugar in juices. The process involves removal of aroma/flavour volatiles from juice by forming a micro-aerosol by spraying juice at a temperature of from 45°C to 110°C through a nozzle having a diameter of about 100 microns to 1,200 microns at a velocity of 100 m/s to 250 m/s and into a vacuum chamber at 5 mm to 200 mm Hg and at temperatures of from 10°C to about 55°C. The recovered juice fraction is then treated with yeast. The alcohol formed by this fermentation reaction is removed by distillation, preferably by the same aerosolization process as the volatiles are removed. The aroma and flavour volatiles are returned to the juice to provide a good tasting low calorie fruit juice. (Source: www.freepatentsonline.com)

PACKAGING

Cinnamon-based packaging to prevent food spoilage

Active paper packaging containing a cinnamon-based coating inhibits black bread mould on white bread, claims a new study. Researchers at the University of Zaragoza, Spain, have found that solid wax paraffin incorporating cinnamaldehyde-fortified cinnamon essential oil is an efficient antimicrobial coating for paper or board packaging to inhibit white bread spoilage. The study aimed to test the antifungal activity of the active paper against *Rhizopus stolonifer* fungus, one the most prevalent spoiler of bread and baked goods. It found that the use of active paper packaging is "a smart alternative for protecting bread from fungal infestation since no direct contact between the food and the packaging is required." The theory is that the release of active chemicals from the active coating to the internal atmosphere in the packaging is responsible for the antifungal activity.

The project partner, Rylesa-Repsol-YPF, manufactured an active paper using a paraffin formulation containing the appropriate amount of cinnamon essential oil as an active agent. The manufacture of the coating included a heating step at 100°C for ten minutes. Paper was double-coated, with only one side having the active coating. The paper was then tested against mould *R. stolonifer* using a vapour test. The results showed that 6 per cent (w/w) of the essential oil in the active coating formulation completely inhibited the growth of *R. stolonifer*. The active paper was further evaluated with food by using sliced bread and varying storage times and similar results were obtained. (Source: www.bakeryandsnacks.com)

New MAP film for meat

Cryovac, a subsidiary of Sealed Air Corporation in the United States, has developed a modified atmosphere packaging (MAP) film for meat and poultry that provides product-to-film contact without discolouration and reduces film waste. Cryovac Mirabella DL150 is a fully printable, thin, high barrier shrink film that is separated to form a small gap that is filled by the MAP, which provides high

oxygen pressure in the meat-to-film contact areas, allowing the meat to maintain its bright colour and shelf life. Tray height can be reduced by 40 per cent, compared with standard tray lidding, and thinner packaging saves space in retail display.

Cryovac has also introduced a new foam C-PET tray for the ready meals market which weighs 30 per cent less than standard rigid trays of a similar size and can be sealed with the firm's DOF film line. The special thermal insulation of the tray allows it to remain cool to the touch after heating, or not too cold when taken straight from the freezer to the microwave. (Source: packagingnews.co.uk)

VFFS packaging system for special bag formats

TNA, a leading supplier of integrated packaging and processing solutions for food production companies, has launched the robag® 3 Vertical Form-Fill-Seal (VFFS) packaging system, with new kanga jaw technology for high quality specialty bag formats and long bag applications such as cereals and frozen food.

One of the robag 3 innovations is its ability to provide a continuous, regular and smooth film speed; perfect for all types of films, including high sensitivity films. The new kanga jaw innovation, designed to accommodate high-quality flexible bag formats such as quattro and block bottom, is powered by a linear motor. It adds an up and down motion of up to 120 mm to the rotating jaws of robag 3. A highly versatile control option is integrated into the systems software so that the facility can be switched on or off as required. *Contact: Mr. Shayne De la Force, Marketing Manager, TNA Australia Pty. Ltd., 24 Carter Street, Sydney Olympic Park, NSW 2127, Australia. Tel: +61 (2) 9714 2321; Fax: +61 (2) 9748 2970; E-mail: shayne.delaforce@tnasolutions.com.* (Source: news.thomasnet.com)

New film provides low-temperature sealing

A new low-temperature sealing biaxially oriented polypropylene (BOPP) grade film can increase output for bakery and chocolate manufacturers, while reducing their environmental impact, claims

its manufacturer wiPak GmbH, Switzerland. The uncoated Walothen C25XLS E film provides an alternative to conventional coated films and can be sealed at a temperature as low as 65°C, making it ideal for temperature sensitive foods such as bakery and confectionary products.

According to wiPak, polypropylene is resistant to most chemical solvents, is tasteless and odourless, and safe for use in contact with food. "The C25XLS E provides excellent scratch resistance and slip properties coupled with reduced energy consumption as a result of the low temperatures employed, thus making it a cost-effective substitute for cold seal films," said Mr. Bernd Sperlich, R&D Manager. The film, with a thickness of 25 microns, is suitable for any high-speed packaging equipment.

To enable printing and lamination, the film surface is activated by a high-frequency electrical discharge and enriched with chemically bound oxygen (corona treatment). The orientation process that the film undergoes during its production gives it excellent gloss, clarity and mechanical strength, wiPak said. The film is stretched in machine direction to five times its original length, and then in transverse direction to 10 times its width, before being heat-set and wound into reels. (Source: www.confectionerynews.com)

Ovenable food packaging

ConAgra Foods, the United States, has patented, jointly with Mr. Doug Czajkowski and Mr. Adam Pawlick, a dual-component, ovenable food packaging. The packaging comprises a heat-resistant tray, which will hold the food, and a non-venting plastic film overwrap to wrap and vacuum-seal around the tray and food item. The patent claims that the food could be cooked in the tray with the overwrap intact. (Source: www.freepatentsonline.com)

Food Technology Information Service

Food Technology Information Service (FTIS) provides free access to technical papers, primarily concerning the ASEAN region, with a focus on Thailand. For more information, contact:

Technical Information Services

*King Mongkut's University of Technology Thonburi
P.O. Box 51, Ratburana, Bangkok 10140, Thailand
Tel: +66 (2) 2470 9615, Fax: +66 (2) 2428 4014
E-mail: food.tis@gmail.com, Web: www.asefood.info*

MACHINERY/ EQUIPMENT

Robot for high-speed food processing

FANUC Robotics, the United States, has introduced a picking robot designed to handle both primary and packaged food at high-speeds. The M-430iA/2F can continuously complete up to 120 cycles every minute with a 1 kg payload and up to 100 cycles per minute with a 2 kg payload. It can operate in over five axes.

According to the developer, the robot unit also has a special coating and seals to withstand the caustic food industry cleaners and acids used in plant washdown. It meets IP-67 standards, and is also claimed to be the first to meet the hygiene requirements for meat and poultry processing set by the United States Department of Agriculture. The device is supplied with the PickTool software and iRVision system. *Contact: FANUC Robotics America Inc., 3900 West Hamlin Road, Rochester Hills, Michigan 48309-3253, United States of America. Tel: +1 (248) 377 7000; Fax: +1 (248) 276 4133.* (Source: www.robotautomation.com.au)

Wet-mix process systems

Bematek Systems Inc., the United States, offers custom-engineered wet-mix process systems that feature colloid mills and positive displacement feed pumps, packaged to achieve specific customer requirements for emulsifying, dispersion and particle size reduction. These systems will provide users with a finished product that is homogeneous, has repeatable viscosity and dispersion down to 1 micron, and totally consistent from batch-to-batch. They can be designed for handling viscous materials from 1,000 cP onwards, with flow rates from 0.5 up to 300 gpm, depending upon the application.

Ideally suited for food, pharmaceutical, cosmetics and chemical applications, Bematek wet-mix process systems can be supplied for continuous or batch processing in laboratory, pilot plant, and production environments. The Colloid mills comply

with 3A sanitary standards, and United States Food and Drug Administration and Department of Agriculture regulations. (Source: www.bakeryonline.com)

Simultaneous batching system

Ingredient Masters Inc., the United States, has introduced a system that simultaneously processes up to 20 batches per hour, each with up to 24 components. The system is well suited to a broad range of food processing requirements, as well as many industrial applications.

The Ingredient Masters system is engineered for recipe sizes of 4.5 kg to 90 kg each, and maintains an accuracy of ± 0.009 kg per ingredient with the use of screw (spiral-type) feeders. The transfer conveyor can be scaled for gain-in-weight, (which provides slightly higher accuracy) or loss-in-weight, (which is faster) at customer option. The batching systems use 4 to 30 dispensers, each of which is 0.79 m³ to 2.9 m³ in capacity. Dispensers, made of rotationally moulded polyethylene, are exceptionally durable and remain "sweat-free" when temperatures fluctuate. System operation is via a LC and a PC. The software allows virtually unlimited storage of recipes and a master list of ingredients and operating parameters for each. (Source: www.bakeryonline.com)

Mini batch processors

Two miniature-scale batch processors for high viscosity products, including toffees, jellies and jams, were launched recently by Armfield Inc. in the United States. The FT141 and the FT142 are batch processing vessels suitable for high shear mixing, dispersing, homogenizing, emulsifying, evaporation and vacuum de-aerating. The machines allow product developers to test ideas on a small scale to gather data to decide whether or not to scale up for commercial production.

Both machines can process up to 10 or 20 litres of product. Each model comprises a jacketed mixing tank, high-speed mixer, agitator, vacuum system, steam heating and control panel. The FT141 can process at 95 per cent vacuum up to a temperature of 100°C, while, the FT142 is capable of UHT processing up to a temperature of 140°C and a pressure of 3 bar. (Source: www.confectionerynews.com)

RECENT PUBLICATIONS

The AlveoConsistograph Handbook, 2nd Edition

The AlveoConsistograph helps one to classify, control and select wheat and flour, and optimize their blending for specific rheological properties. It measures the effects of improvers, ingredients and other additives resulting in better control of dough on the production line and more consistent end-product quality. The handbook provides an understanding of the technical data generated by this instrument and gives application examples. It explains the workings of the Chopin Consistograph and provides an insight into its coupling with the Chopin Alveograph. This is the first revision of this handbook in 20 years, and it explains major modifications and improvements of the Alveograph through new and revised chapters.

Contact: AACC International Press, 3340 Pilot Knob Road, St. Paul, MN 55121, United States of America. Tel: +1 (651) 994 3840; Fax: +1 (651) 454 0766; E-mail: aaccpress@scisoc.org.

In-pack Processed Foods: Improving Quality

The book reviews recent advances in packaging formats and processing technologies. The first part covers novel can designs and non-traditional packaging formats, such as retort pouches. The second part examines the developments in processing and process control technology. Part three addresses the safety of in-pack processed foods, including concerns over pathogens and hazardous compounds in processed foods. The book concludes with chapters on novel methods to optimise the quality of particular types of in-pack processed foods such as fruit and vegetables, meat, poultry and fish products.

Contact: Woodhead Publishing Ltd., Abington Hall, Granta Park, Great Abington, Cambridge CB21 6AH, United Kingdom. Tel: +44 (1223) 891 358; Fax: +44 (1223) 893 694; E-mail: wp@woodheadpublishing.com.

TECH EVENTS

7-10 Nov
Kolkata
India

FOODTECH, HOTEL TECH, BAKERY & DAIRYTECH INDIA 2008
Contact: N. K. Kapur & Co. Pvt. Ltd., C-151A, Mayapuri industrial Area-II, New Delhi 110064, India.
Tel: +91 (11) 2811 7927;
Fax: +91 (11) 2811 7930;
E-mail: info@nkkapur.com.

3-6 Dec
Jakarta
Indonesia

PROPAK INDONESIA 2008
Contact: PT. Pamerindo Buana Abadi, Deutsche Bank Building, 13th Floor, Jalan Imam Bonjol No. 80, Jakarta 10310, Indonesia.
Tel: +62 (21) 316 2001;
Fax: +62 (21) 316 1981;
E-mail: info@pamerindo.com.

4-6 Dec
Shanghai
China

FHC - Food & Drink 2008
Contact: Hong Kong Exhibition Services Ltd., Unit 2010, 20/F, China Resources Building, 26 Harbour Road, Wanchai, Hong Kong, China.
Tel: +852 2804 1500;
Fax: +852 2528 3103;
E-mail: exhibit@hkesallworld.com.

2009

4-6 Mar
Bangalore
India

Agri & Food Processing India 2009
Contact: Adhesion Group / BCI, 71, rue des Tilleuls, 92771 Boulogne-Billancourt, France.
Tel: +33 (1) 4186 4186;
Fax: +33 (1) 4603 8626;
E-mail: info@adhes.com.

17-20 Jun
Bangkok
Thailand

ProkPak Asia 2009
Contact: Bangkok Exhibition Services, SPE Tower, 9th Floor, 252 Phaholyothin Road, Samsennai, Phyathai, Bangkok 10400, Thailand.
Tel: +66 (2) 615 1255;
Fax: +66 (2) 615 2991-3;
E-mail: enquiry@besallworld.com.

25-27 Jun
Cebu City
Philippines

CEBU FOOD EXPO 2009
Contact: Global-Link Inc., Unit 1003, Antel 2000 Corporate Centre, 121 Valero Street, Salcedo Village, Makati City, The Philippines.
Tel: +63 (2) 750 8588;
Fax: +63 (2) 750 8585;
E-mail: jing@globalinkph.com.

PUBLICATIONS from APCTT

PERIODICALS

(Free access at www.techmonitor.net)

- Asia Pacific Tech Monitor (6 issues/year) (e-version only)
- VATIS Update (6 issues/year)
 - Biotechnology (e-version only)
 - Non-conventional Energy (e-version only)
 - Food Processing (e-version only)
 - Ozone Layer Protection (e-version only)
 - Waste Management (e-version only)

BOOKS

	Indian Rupees* (India, Bhutan and Nepal)	US Dollars*
--	--	-------------

- | | | |
|--|--------------------------------------|----------------------------------|
| <input type="checkbox"/> Managing Innovation for the New Economy: Training Manual, 2002
Volume 1: How to Guide & Quick reference materials
Volume 2: Articles & Lectures | 1,000.00 | 50.00 |
| <input type="checkbox"/> Regional Capacity-building for the Adoption of ISO-14000 and Transfer of Environmentally Sound Technology: Training Manual, 2000 | 600.00 | 30.00 |
| <input type="checkbox"/> Small Rural Industries in the Asia Pacific Region: Enhancement of Competitiveness of Small Rural Industries in a Liberalized Economic Environment and the Impact of Poverty Alleviation, 2000 | 600.00 | 30.00 |
| <input type="checkbox"/> Technology Transfer and Technological Capacity-building in Asia and the Pacific <ul style="list-style-type: none"> <input type="radio"/> Volume 1: Big Countries and Developed Economies, 1999 <input type="radio"/> Volume 2: ASEAN, NIEs, SAARC and the Islamic Republic of Iran, 1999 <input type="radio"/> Volume 3: Least Developed and Pacific Island Countries and Economies in Transition, 1999 <input type="radio"/> Volume 4: Emerging Issues in Regional Technological Capability-building and Technology Transfer, 1999 | 600.00
600.00
600.00
600.00 | 30.00
30.00
30.00
30.00 |
| <input type="checkbox"/> Rural Industrialization as a Means of Poverty Alleviation: Report of the Regional Seminar on the Enhancement of Partnerships among Governmental, Non-governmental and Private Sector Entities for the Promotion of Rural Industrialization for Poverty Alleviation, 1999 | 600.00 | 30.00 |
| <input type="checkbox"/> Institutional Development for Investment Promotion and Technology Transfer, 1999 | 500.00 | 25.00 |
| <input type="checkbox"/> Ozone Depletion Substances Phase-out Technologies: Problems & Issues on Technology Transfer, Absorption and Generation, 1998 | 300.00 | 15.00 |
| <input type="checkbox"/> Development and Utilization of S&T Indicators: Emerging Issues in Developing Countries of the ESCAP Region, 1998 | 300.00 | 15.00 |
| <input type="checkbox"/> ODS Phase-out: A Guide for Industry, 1998 | 500.00 | 25.00 |
| <input type="checkbox"/> Proceedings of the Consultative Meeting on Technology Management Education and Training for Developing Countries, 1997 | 800.00 | 40.00 |

Notes: (1) Amount less than Rs 500 should be sent through a demand draft only. Otherwise, payment should be made by cheque/demand draft/UNESCO coupon in favour of the Asian & Pacific Centre for Transfer of Technology, payable at New Delhi.

(2) Subscription through Credit Card should be supplemented with a photocopy of the Credit Card (front & back)

* Amount to be sent to APCTT with the order for covering costs and handling charges.