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FEBRUARY/MARCH 2013



Super Natural

New ingredients are making a splash

Also Inside

PACKAGING HITS A NEW PINNACLE WITH PERSONALISATION

FREEKEH POISED FOR A BIGGER ROLE IN GRAINS

DHA LINKED TO IMPROVED READING SKILLS

NATUREX 
Ultimate Botanical Benefits

ON THE COVER

Naturally Yours

As of December 2012, Naturex Australia expands its activities into the nutraceutical and food supplement industries. The offer includes a wide range of botanical extracts and branded ingredient concepts targeted at the nutrition and health market.

The complete Nutrition and health product portfolio includes two ranges. Nutraceutical manufacturers will find in the NATactiv range all the benefits of plants in the form of standardised and specialty extracts. This portfolio has been recently strengthened with the acquisition of Decas Botanical Synergies, the leader in cranberry-derived ingredients for the Nutrition and health industry.


Pushing the boundaries of innovation, NATlife is a range of branded ingredient concepts backed by in depth bibliographic researches and clinical studies. These unique ingredients have a proven activity and help to improve the quality of life (weight management, anti-stress/sleep disorder, urinary tract infection, physical performance, cognition and hot flashes). They make food supplements stand out from the crowd thanks to cobranding and dedicated marketing tools.

The natural ingredients made by the Food and beverage business unit improve the organoleptic characteristics (color, flavor, taste, texture) and nutritional properties of finished products. The NATstabil range includes true clean label alternatives to chemical antioxidants for food preservation and NATcolor offers endless possibilities in colour with precise and natural additives that illuminate products. NATarom contains technologically advanced flavoring ingredients from a variety of sources. The NAThealthy range comprises of numerous botanical extracts, standardised in active molecules that target health and nutrition. NATtextur helps create texture naturally through a wide palette of texturising solutions with gelling, thickening and stabilising properties. The ingredients from the NATtaste line help to improve taste naturally by increasing the flavour and the taste delivery and masking off-notes and aftertastes, helping balance and modulate the total taste experience. Finally the NATF&V range contains the best from fruits and vegetables. These premium ingredients upgrade products and enhance the taste,

nutritional profile and natural image of food and beverages. A large array of shapes and colors is available for a unique mouthfeel and visual appeal.

Naturex Australia also has local application laboratories with a colour development technologist and two senior applications experts drawing on a wealth of experience within the food and beverage industries.

The local production facility allows reactive production and can manufacture locally tailor made solutions for both liquid and powder products.

The growing trend is towards “all things natural” which is exciting for a team that focuses on natural and a portfolio of synergistic ingredients. So if you are looking for expertise and support, the “natural” choice is Naturex Australia. 



NATUREX 
Ultimate Botanical Benefits

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38

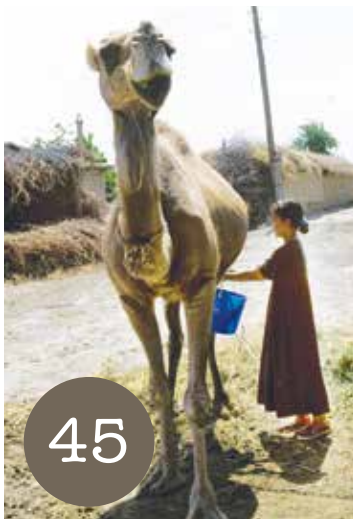
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32



45



31

CONTENTS



8



9



18



20

FEATURES

18 In the Spotlight

Providing nutrients to children has been identified as the most cost effective way of improving the world.

20 Cereals and Grains

Freekeh, a relatively unknown grain, offers great potential, and increasing interest in gluten free products seems to defy science.

26 Research

A new study shows that DHA improves reading and behavior in children

31 Packaging

Absolut has taken personalisation to a whole new level while bio-packaging hones in on food.

34 Q&A

With the 2012 Malcolm Bird Award winner.

36 Functional Foods

Trends to look for in 2013.

40 Conference News

Highlights of a symposium on health and nutrition for an ageing population.

42 Ingredients

Research on squash and sesame oil may lead to new products, vitamin K2 and a tomato-based concentrate are two of the latest offerings with Euro health claims.

45 Final Word

Camel cheese may bring new opportunities to camel farmers in Africa.

REGULARS

05 By the Numbers

06 News

12 People

14 AIFST

46 Diary

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FROM THE EDITOR

Is it just me or is packaging one of the most innovative areas in the industry at the moment? From using corn and mushrooms as packaging material ("Bio-packaging", page 32) to developing a production line capable of making nearly four million unique bottles ("Going to Extremes", page 31), clever minds seem to have no bounds when it comes to thinking of novel ways to store food and drink.

Not that innovation isn't happening elsewhere – Queensland scientists have identified a healthier, 'super' strawberry (Research, page 38) and a South Australian entrepreneur has opened up the market for producing commercially viable freekeh ("Freekeh Inside", page 20) while also verifying some of the health claims of the little known grain.

The annual flurry of New Year trend forecasting, which seemed to involve many of the same themes – a quest for more "natural" ingredients, creating ways to allow food products to have an even longer shelf life and treating food as a vehicle for health – has left me with a few questions. When does a trend become the norm (e.g. many of these "trends" seem to be a fairly permanent part of the food industry)? And does anyone think that two or three years from now products with shorter shelf lives will be in vogue?

A special thanks to those who participated in the reader survey. Your feedback will help us ensure that *food australia* continues to provide the information you want.

Lynn Elsey

Editor

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BY THE NUMBERS

ORGANIC GOES MAINSTREAM

Organic is now the norm with more than two thirds of Australians buying organic food at least occasionally.

According to the *Australian Organic Market Report*, the growth in organic sales reflects changing perceptions about organic food. Some of these beliefs, including that organic food is more nutritious, clash with a widely reported comprehensive meta-analysis undertaken by researchers at Stanford University (*Annals of Internal Medicine*, Volume 157, Number 5, 2012) that found no evidence that organic foods are significantly more nutritious nor have fewer health risks than conventional foods, although they may reduce exposure to pesticides. These findings were backed up by research from the American Academy for Pediatrics which found that organic food contained the same amount of vitamins, minerals, antioxidants, proteins and lipids as non-organic food.

The findings don't quite tally with these comments in the report: "the research suggests that community understanding of the key benefits of organic is well entrenched and clear."

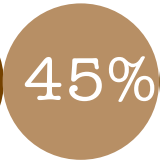
Here are few highlights from the report.



The value of Australia's organic industry: \$1.276 billion



75% of organic products are purchased at major supermarkets



What organic products are consumers buying?

- 60% fresh fruit and vegetables
- 45% home-cooking ingredients
- 39% canned goods

\$220 million

The value of exported organic products



Australia has the world's largest surface area of certified organic land, 11,199,577.4 ha



Which benefits are most important to you?
Chemical free 89%
More nutritious: 88%

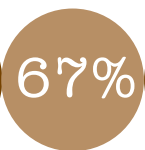
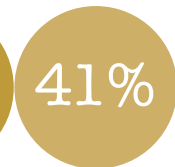
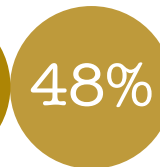
65% of consumers purchase organic food occasionally



Barriers to purchasing: Price: 80%

Knowing you can trust it really is organic: 48%

Quality of produce: 41%



What are the benefits of organic food?

- Chemical free 79%; environmentally friendly 67%;
- GMO free 55%; more nutritious 47%; better tasting 42%.

The *Australian Organic Market Report* is published by the Biological Farmers of Australia (BFA), based on research from Swinburne University, the Mobium Group, Australian Bureau of Statistics and BFA.



CHOBANI OPENS VICTORIAN PLANT

Chobani has opened a state-of-the-art \$30 million yogurt factory in Dandenong South as part of its fast-tracked Australian and Asian expansion plans.

Although only seven years old, the US Greek-style yogurt company has achieved remarkable growth and now ranks as the US's top selling yogurt company, with more than 20 per cent of the market. Chobani purchased Victorian dairy company Bead Foods in 2011 as its first overseas portal.

"We chose Australia as our first international market to launch Chobani because of its amazingly high-quality milk, and we knew that Australians are passionate about great-tasting food," Chobani founder Hamdi Ulukaya said at the plant's opening ceremony in December 2012.

The new plant will allow a tripling of production to more than 30,000 tonnes of yogurt per year.

Along with 50 new jobs created in the last year, the company anticipates an additional 150 jobs over the next three years as the plant reaches capacity.

The expansion will allow greater coverage of the Australian market as well as providing an export hub for growth into Asia.

Chobani's rapid rise has been credited to the product itself – which has two times the protein found in regular yogurt – along with a savvy use of social networks to create a loyal following and its policy of giving 10 per cent of its annual profits to charities worldwide.

The company also just opened what it claims to be the world's largest yogurt plant, covering one million square feet, in Twin Falls, Idaho (US). ¹⁰

CAROB SHOWS PROMISE AGAINST LISTERIA

According to a recently published study, extracts of carob leaves are effective at inhibiting the growth of *Listeria* bacteria in the lab.

The research, which was published in the *Journal of Agricultural and Food Chemistry* (10 October, 2012), is a response to an ongoing search for new natural compounds to replace popular antimicrobial chemicals – especially in light of increases in antibiotic-resistant bacteria.

According to researcher and lead author Nadhem Aissani, University of Cagliari, Italy, although carob has been flagged as a potential antibacterial substance, until now it hasn't been tested against *Listeria*. Using a broth microdilution method, the scientists found that the methanolic extract of carob leaves (MECL) inhibited the growth of *Listeria*.

The positive results of the study have prompted the researchers to continue testing carob extracts on meat and fish samples. ¹¹

A NEW OPTION FOR RIPENING FRUIT

Scientists from the University of Queensland claim to have developed a new technology that could have a significant impact on the fresh fruit industry. Bhesh Bhandari and Binh Ho, from UQ's School of Agriculture and Food Sciences, say they have created a food grade biological powder that releases ethylene gas in humid and high temperature conditions, overcoming many of the current problems regarding the use of compressed ethylene gas for artificially ripening fruit.

The team identified a starch derivative material that allows the encapsulation of ethylene gas in powder form. The gas is released from the powder when the temperature and

humidity are elevated. The new process makes the use of ethylene easier, safer and also allows for small batches of fruit to be ripened according to Bhandari.

Bhandari presented his findings at the International Drying Symposium in China where he received the "Excellence in Drying Award" in recognition of his research in drying science and technology.

The scientists are currently working with UniQuest, University of Queensland's commercialisation company, to prepare the technology for investment and licensing opportunities. ¹²

AN EDIBLE DEODORANT



A candy that releases a rose scent after consumption is attracting attention around the world.

The rose-scented boiled sweet, Deo Perfume Candy, contains geraniol, a natural alcohol found in the essential oils of several aromatic plants that evaporates through the skin. It also contains isomalt, a slow dissolving sugar replacement derived from sugar beet, which helps extend the rose flavour.

One serving size (four pieces of candy) contains around 12 mg of geraniol and generates a fragrance effect lasting six hours (depending upon body weight), as the ingredient slowly evaporates.

The product was co-developed by US ingredient company Beneo and Bulgarian Alpi.

Although Deo is generally being displayed in the confectionery aisle it was initially designed as a natural deodorant. The technology is based on Japanese research, where studies showed that when ingested, rose oil exudes aromatic compounds, such as geraniol, through the skin.

Beneo describes the product as having similar properties to garlic.

“Many people like garlic, and it’s especially popular in European diets, but the tell-tale smell lingers for some time after a meal. Deo is the perfect antidote,” said Wim Dries, area sales manager for Beneo in a statement.

Deo is being manufactured by Alpi in Bulgaria. The product was initially marketed in Bulgaria, Czech Republic and Hungary. The US launch, near the end of 2012, was so successful that the supplier ran out of stock. The product is now being rolled out across Europe; plans for an appearance in Australia or New Zealand were not available. ⑩

FISH OIL SUPPLEMENTS QUESTIONED

A new review by Cambridge University scientists has found that eating oily fish reduces the risk from stroke but taking omega 3 supplements doesn’t have the same impact.

The researchers analysed 38 studies involving nearly 800,000 people in 15 countries to look at the association between consuming fish and the risk of stroke and mini-strokes (transient ischemic attack). Their results, which were published in the *BMJ* 30 October 2012, (*BMJ* 2012;345:e6698), showed that people who ate two to four servings of oily fish per week had a six per cent lower risk of stroke than those who ate one or less servings a week; those who consumed more than five servings a week had a 12 per cent lower risk.

However, the team, which was led by Rajiv Showdhury, of the University of Cambridge, found that taking fish oil supplements did not lead to any reduction in risk of stroke.

“This review found that higher fish consumption is moderately but significantly associated with a reduced risk of incident cerebrovascular disease. By contrast, dietary, circulating biomarkers and supplements of long chain omega 3 fatty acids were not significantly associated with risk of cerebrovascular disease.

“These findings therefore suggest that single nutrients may have limited effects on chronic disease outside of their original food sources,” according to the authors.

The researchers said that the results were consistent across people with and without pre-existing cardiovascular disease.

They suggested a number of reasons to explain why eating fish could improve vascular health, including that it may be due to a wider array of nutrients and their interactions found in fish.

Other possible explanations are that by eating fish, people are eating less food that is detrimental to cerebrovascular health, “such as red meat”, or that higher fish consumption may be indicative of an overall healthier diet or higher socioeconomic status, they said. ⑪

AN APPLE FOR LONGER LIFE

An Australian company has developed a product designed to make a dent in the estimated \$1.1 billion worth of spoiled fruit and vegetables discarded by Australians each year.

BluApple is an ethylene oxidising device created for home use to help extend the storage life of produce. It works by lowering the ethylene gas surrounding fruit and vegetables, thereby reducing spoilage.

The mineral zeolite, which is contained in a replaceable packet inside the plastic blue apple, is used to host the permanganate.

According to the manufacturer, Biofarm Artel, the product can extend the storage life of produce up to three times longer than normal, but notes that storage conditions can impact the process and taste. It can be used in a refrigerator produce drawer or in a non-refrigerated container.

BluApple is sold online and through some retail stores including Target. ⑫



NEW ZEALAND SIGNS FOOD SAFETY AGREEMENT WITH FDA

New Zealand has become the first country to sign an agreement with the US Food and Drug Administration which puts its food safety system on equal footing with the US.

The Food Safety Systems Recognition Arrangement was signed in Washington DC in December by delegates from New Zealand's Ministry for Primary Industries (MPI) and the FDA. The agreement recognises that each country's food safety system has a comparable degree of safety assurance.

"This is momentous for MPI as it is the first time the FDA has recognised another country's food safety system as comparable to its own," said Carol Barnao, the MPI deputy director general standards, in a statement.

Barnao said that the process involved a significant amount of work by both sides including a comprehensive review of each country's laws and regulations, inspection programs, compliance and enforcement.

She said the new agreement will allow a reduction in food trade regulatory burdens between the two countries by removing unnecessary duplication of activities.

The agreement covers all foods and animal feeds regulated by the FDA, equalling \$1.5 billion of New Zealand's current primary products exports.

"The arrangement with New Zealand is part of an overall strategy for strengthening the global food safety net through closer collaboration with regulators around the world," said Michael Taylor, FDA's deputy commissioner for food. ³⁰

SA OPENS HEMISPHERE'S LARGEST GLASSHOUSE

Following an expansion, South Australia now has the largest indoor horticulture facility in the southern hemisphere.

The d'VineRipe glasshouse in Two Wells, which opened six years ago, now has 27 hectares of floor space, upping its production capacity of hydroponic tomatoes to 12,500 tonnes per year. The roof includes around 140,000 panes of strengthened glass.

The glasshouse contains a number of environmentally-friendly features including an onsite reverse osmosis water treatment plant, a pad and fan climate control technology and specialised glass to filter harmful ultra-violet rays.

Although more than 100 automated guided vehicles are used to deliver the picked tomatoes to the packing facility, Jon Jones, d'VineRipe general manager, said that all crop work was still carried out by hand. Enhanced computer systems allow full traceability to improve worker time management and other efficiencies, he said.

The \$90 million d'VineRipe glasshouse is a joint venture between the Victor Smorgon Group and Perfection Fresh Australian. ³¹



SKILLING UP FOR A CAREER

Communication ranks as the most important skill for food scientists and technologists according to a new report.

A team from the EU's TrackFast project (Training Requirements and Careers for Knowledge-based Food Science and Technology in Europe) conducted a Europe-wide study to determine the skills most useful to employers in the industry.

The study involved 16 workshops held from March 2010 to August 2011 where attendees were asked to name the most desirable skills and competencies for employment in the food science industry in a quest to "design" the ideal food employee of the future.

Analysis of the results found that 'soft skills', topped by communication, were rated more important than any food science-specific expertise, capturing 76 per cent of all skills mentioned. Product development was the highest rated industry-specific competency.

The researchers concluded that the acquisition of soft skills would help improve Europe's food workforce.

The study, "Ideal skills for European food scientists and technologists: Identifying the most desired knowledge, skills and competencies", was published in the September issue of *Innovative Food Science and Emerging Technologies*. ³²

DARRELL LEA RETURNS



Darrell Lea is back – with a new look, a much slimmer product line and broader distribution channels.

Quinn Foods, the rescuer of Darrell Lea, wasted little time making significant changes to Australia’s 85-year-old confectioner and Australia’s largest licorice producer after purchasing the company in September 2012.

Although the products have undergone a complete re-branding and re-packaging – including the new tagline “Everyone’s Darrell Lea” – the recipes haven’t changed. The number of products has dropped from 700 to 186, which is a reflection of market realities and consumer interest, according to Klark Quinn, general manager of Darrell Lea.

“It was a pretty simple decision. A lot of products were underperforming, with the sales price being less than the cost of producing them,” Quinn explained. Many were products that people weren’t aware of and others were not made in Australia, he said.

Quinn Foods, Australia’s second largest pet food company, leveraged its well-established supplier relationships with the major supermarkets to ensure that the rebranded Darrell

Lea products had a quick entry into their stores, with a result that the products are now available in all major stores along with newsagents, gift shops and pharmacies. However, Darrell Lea stores will not be reopened.

Quinn said that the company is focusing on expanding internationally as well as domestically. At present, a third of Darrell Lea’s business comes from the US where the company’s licorice is one of the country’s top three brands.

“We are just scratching the surface of that market,” Quinn said. “We want to grow that market exponentially, and grow the Australian market as well.”

The company plans to explore new products opportunities including more “creative and fun” products, Quinn said. It has eyes on the Australian licorice market, which lags behind the US, and also plans to increase focus on Rocky Road, another big American seller.

Quinn said he was overwhelmed by the Australian support for Darrell Lea. He also expressed amazement of the attitude of the Sydney-based staff, “everyone here is so passionate about what they do; I’m just so lucky to be involved,” he said.

“There’s a lot of similarities between the food science of pet food and confectionery,” Quinn said, although there is a big difference in their customers. “We don’t have fans in pet food.”

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DAIRY DELIGHT

The challenge: create a meal using 20 award-winning dairy products.

Words by Lynn Elsey

To commemorate the 2013 Australian Grand Dairy Awards, Melbourne restaurant Circa, The Prince, was asked to host a special lunch on 26 November 2012.

The AGDA awards recognise quality, excellence and innovation in Australian dairy produce. Judging is only open to products that have already been successful in state competitions. Out of 399 products from 84 different Australian companies tested, 20 were selected as Champions and two – Tasmanian Heritage St Claire cheese and Bulla Premium Sour Cream – were named as Grand Champions for 2013.

Jake Nicolson, Circa's head chef, decided to help honour the winners by creating a meal using all 20 award-winning products. The challenges included crafting a menu based on a number of ingredients that are not commonly found at the Pacific Rim-influenced Circa these days.

"It was a totally different style to the type of food we serve in the restaurant," he admitted. "But it was a bit of fun for us."

The menu design process took a few weeks, involving a bit of back and forth with the team at Dairy Australia who were hosting the event. It also required familiarisation with the products.

"I had to learn about all the ingredients. Putting it all together was like trying to do a Sudoku puzzle," Nicolson said.

"It was pretty challenging, incorporating all the products and given equal footing to them all," he said. "On the other hand, they were all great products, which made it easy for me."

Those lucky enough to taste the results would have happily granted Nicolson and his team an honorary award, and even suggest a new name for the restaurant – Circa the Dairy, perhaps?



The 2012 Australian Grand Dairy Awards Menu

Canapés and Starters

- Parma ham and **Jindi Reserve Washed Rind** tartlets with wild mango chutney
- **Pyengana Cheddar** gougeres
- Mini Wagyu beef tongue Reuben with **Tasmanian Heritage St Claire**
- **Paradise Beach Pesto Swirl Dip** with semolina crackers
- Bread served with **Western Star Original Butter**
- Grilled peaches with **Cuore Blu Burrata** grapefruit and thyme vinaigrette
- Wood grilled local asparagus with shaved culatello and **Mil Lel Superior Pepato**
- **Mil Lel Superior Parmesan** panna cotta with young spring vegetables
- Ancient grains with pickled watermelon, olives and **Jalna Greek Natural Yoghourt** labneh

Main Course

- Mushroom crusted veal cutlet with **Old Telegraph Road Heritage Blue** butter
- Moroccan spiced Milawa chicken with honey and cumin **Bulla Premium Sour Cream**, parsley, pine nuts and currants
- Robata grilled rainbow trout with roasted almonds, broccolini and heirloom tomatoes

- Triple cooked potatoes
- Asian leaves, nashi pear, shaved jicama

Dessert

- 'Ile Flottante' with **Oak Egg Nog**
- Tropical fruit Eton Mess with **Brancourts Premium Dessert Mango Yoghurt**
- **Dooley's Licorice Ice Cream** with caramelised blood oranges
- Chocolate and **Cow and the Moon Pistachio Gelato** lollypops
- **King Island Dairy Belgian Chocolate Crème Dessert** and cherry cones

Cheese Course

- **Old Telegraph Road Brie** with pickled jackfruit
- **Red Hill Mountain Goat Blue** with walnuts and fresh honeycomb
- **Tasmanian Heritage St Claire** with mustard fruits, **Pyengana Cheddar** with apple and raisin slaw

Selection of tea, espresso coffee, hot chocolate or a glass of chilled milk featuring **Sungold Jersey Milk** and **Norco Hi Lo**.

Award winners highlighted in blue

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PEOPLE

Australian Business Woman of the Year

Carolyn Creswell has been named as Telstra's Australian Business Woman of the Year. Creswell is the head of a \$50 million muesli enterprise that exports to 32 countries. She started the business in 1992 as first year university student in Melbourne, and today Carman's Fine Foods produces 22 muesli, porridge and muesli bar products. The business has around 130 staff and focuses on Australian ingredients and suppliers. Creswell also received the 2012 Commonwealth Bank Business Owner Award.

IUFoST Awards

David Lineback has been named as the International Union of Food Science and Technology 2012 Lifetime Achievement Award winner. The award honours an individual for pre-eminence in and contributions to the field of food science and technology over a career. Lineback is past president of the Institute of Food Technologists.

Yapeng Fang was awarded the 2012 Young Scientist Award, which recognises an individual in the initial phases of their career with the potential to make outstanding scientific contributions to the field of food science and technology and potential for future scientific leadership. He was noted for his substantial advancements in the fundamental knowledge of food hydrocolloids.

New MD for Hawkins Watts

Scott Hawkins has taken over as managing director of Hawkins Watts. He has replaced his father, Peter, who will continue serving as chairman of the board. After working in New Zealand and the UK, Scott Hawkins returned to NZ in 2009 and joined the company.

Davey awarded by IDF

George Davey has been presented with the 2012 International Dairy Federation Awards for the advancement of the global dairy industry. Davey is general manager for agriculture at the Royal Agricultural Society of New South Wales.



Peter Brazel and Hon Jeffrey Kennett.

Confectionery Award

Peter Brazel of AAK Australia, a confectionery fats importer and supplier, has been awarded the Alfred Stauder Award for Excellence. Brazel has more than 30 years experience in the food industry.

Woman infiltrates Holstein board

Jenny Grey has been appointed to the Holstein Australia board, the first woman in the organisation's 98-year history.

Matthews has new GM

Mark Dingley has been appointed as general manager of operations for Matthews Australasia. Dingley has held various roles with the company since 1994.

New directors at BFA

Peter Gall and Kim Morgan have been announced as new directors for Biological Farmers of Australia (which will also be undergoing a name change to Australian Organic). They replace Doug Haas and Holly Vyner. Vyner remains as general manager of the organisation.

Murray joins George Weston

Robyn Murray has joined George Weston as director of food technology and quality, a newly created role. She will be



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AppointmentsGroup

responsible for customer applications technology, quality, innovation, product range and varietal development. Murray was previously the CEO of the Grains and Legumes Nutrition Council.



Grahame Turk, Bill Gibson and Bryan Skepper.

Sydney Fish Market

Bryan Skepper is the new manager of Sydney Fish Market, replacing Grahame Turk who has retired. Turk will still be involved with SFM in his new role as chairman of the board, following the retirement of Bill Gibson.



Blake steps down at DB Breweries

Brian Blake is stepping down as managing director of New Zealand DB Breweries. Blake has served as CEO/MD of the brewery for the past 20 years. However, he will continue his

involvement with the brewer as chairman of the board.

Mutton and Di Blasio join Pork CRC Board

In everyone's favourite headline, Dennis Mutton has been elected to the board for the Pork CRC. Mutton is chair of the Council of Rural R&D, BioInnovation SA and the Native Vegetation Council of SA. Sandra Di Blasio has also joined the board. She recently was head of operational risk for BT Financial Group and also has been a member of the Pork CRC audit committee.

New IDF President

Jeremy Hill has been elected as president of the International Dairy Federation. Hill is director of research, science, technology and development for Fonterra Cooperative Group. Hill replaces Richard Doyle who completed a four-year term.

Waters new Woolies chair

Ralph Waters is the new chairman of the Woolworths board, replacing James Strong. Waters is chairman of Fletcher Building, deputy chairman of the Organising Committee for the ICC Cricket World Cup 2015 and a non-executive director of Fonterra and Asciano.

Changes at AFGC board

The Australian Food and Grocery Council has six new board directors: Michael Ryan, general manager of Mars Chocolate Australia; Judith Swales, managing director HJ Heinz Australia; Phillip Lynch, managing director Johnson & Johnson Pacific; Vincent Pinnieri, managing director SPC Ardmona; Clive Stiff, chairman Unilever Australia and Reg Weine, CEO Bulla Dairy Foods. Graham Campbell, managing director and CEO of Nestle Australia, Tim Hart, chief executive of Sugar Australia and Glen Watts, managing director Kimberly-Clark Australia, have all retired from the board.

New faces at AMS

Chris Lane has been appointed as WA sales manager and Paul Nelson has been appointed as Queensland sales engineer for AMS Instrumentation and Calibration. 📍



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AIFST

NEWS & EVENTS

Start off the new year by getting involved in an event or expanding your career horizons through the CPD program.

Rapid Methods Update and Wet Workshop

The Food Microbiology special interest group of Victoria is holding a two-day "Wet" workshop 3-4 April. The workshop will include a lecture and a hands-on practical component. Topics are expected to include an introduction to the technology, sensitivities of detection, an overview of advantages and disadvantages and maintenance requirements.

Participants will receive certificates of completion for the AIFST CPD program.

NSW Networking Purina Tour

The Central West Group of NSW is holding an evening networking event at the Nestle Purina site in Blayney on 14 February. The evening includes a tour of the factory followed by a short meeting and networking.

Professional Development

Along with information on new career enhancing events and our career tools package, members are encouraged to visit the CPD section of the website for new employment opportunities. Employers can also use the site to search for potential employees.

Cooking with Joe

The UniSA sensory group is presenting a technical and networking event featuring Joe McCreanor, the SA branch treasurer and council representative. McCreanor will be sharing his knowledge and interests as a qualified chef and microbiologist on Wednesday, 27 February.

AIFST Award Deadlines

The closing date for many of the AIFST annual awards are drawing nigh, so don't forget to complete the related application process.

As a reminder, the notable closing dates for the 2013 awards are:

- Food Industry Innovation Award – 18 March 2013
- Keith Farrer Award of Merit – 18 March 2013

- President's Award – 18 March 2013
- Jack Kefford Award – 31 March 2013
- Malcolm Bird Commemorative Award – 15 March 2013
- Student Product Development Competition – 15 March 2013
- Bruce Chandler Book Prize – 18 March 2013.

Poster abstracts are due 29 March 2013.

The Annual Convention


The 46th Annual Convention will be held at the Brisbane Convention and Exhibition Centre, 14-16 July, with workshops on 17 July.



Under the theme "Yesterday, Today, Tomorrow", the conference will focus on a number of topics including:

- Practical application of the fundamentals of food science
- The importance of food technology and processing to the food industry
- Key topics in health and nutrition including digestive health and beverages
- Making the most of your career
- Foods for vulnerable populations
- Extending the shelf life of food
- Sensory evaluation
- New product development
- The role of innovation in the industry
- Celebrating Queensland's food icons.

A postgraduate workshop will be held on Sunday, 14 July as part of the convention. It will include industry professionals who will share their considerable experience in the industry along with a participation section, where participants are invited to give short oral presentations.

Visit the AIFST website for updates on the program. 

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VALE JACK KEFFORD FAIFST



The food research community in Australia and internationally has lost one of its most esteemed members following the recent death of Jack Kefford at the age of 95. The Australian Institute of Food Science and Technology has also lost one of its pioneering founders and its third president.

Jack Frederick Kefford was born in Melbourne, Victoria on 8 February 1917 and received his early education at Essendon High School where he showed a keen aptitude for science. He studied chemistry at the University of Melbourne with a number of highly talented chemists including Keith Farrer, Geoffrey Badger, Lloyd Rees, Keith Sutherland and AR Docking. By the early age of 21 he had gained an MSc in chemistry and in June 1938 he joined the (then) CSIR Section of Food Preservation laboratories within the Homebush, NSW, abattoir as assistant research officer.

Kefford initially worked on chemical aspects of the preservation of meat and fish and then in the canning section as Laurie Lynch's senior assistant. During his early years at CSIR/CSIRO pre- and post-war he worked on a range of technical problems. These included an assessment of the performance of tinsplate cans and lacquer systems, with a major emphasis on research programs designed to solve problems referred to the division of food preservation and transport by the armed services. Former chief of the division Jim Vickery reported that Jack Kefford's "unselfishness and his

ability to get the best out of junior research workers reacted against him at a time when personal advancement depended so much on the amount of published research work". He and his co-workers made a huge contribution to the development of processing and inspection specifications for many canned vegetable products that covered issues such as filled and drained weights, style, processing steps, can sizes and lacquers, heat sterilisation and bacteriological principles. Ultimately these food control specifications were published as Commonwealth Food Specifications in 1951. Laboratory procedures led to technical memoranda on "Chemical Examination of Canned Foods" and "The Laboratory Examination of Canned Foods", which were subsequently published in several issues of the division's *Food Research Quarterly* (FRQ) over many years.

Kefford not only had ability as a research supervisor but also as a communicator of technical knowledge, especially the many short courses on food technology he taught during the war to armed services inspectors and government departments.

For students at Sydney Technical College and workers in the food industry eager to learn more about the emerging discipline of food technology, he provided talks in

Technology (now The University of New South Wales) when it commenced in 1949. Kefford and some of his CSIR Homebush colleagues (including Bill Sykes, Bill Scott and EW Hicks) taught the technology components to STC diploma students when it was established in 1948. His long-term interests in extension, communication and education carried on over many years through his extensive publications in the Division's *FRQ* and as chair of AIFST's committee on education and course accreditation.

After the war he resumed intense research activities with colleague Bruce Chandler on the bitterness and other quality problems of processed citrus juices, a problem identified during large-scale processing of citrus for the armed forces. Their work led to international recognition on the role of the bitter principle limonin on citrus juice quality.

The division expanded and flourished following the move to new laboratories and pilot plant at North Ryde in 1961. Following Laurie Lynch's retirement in 1965 Kefford was appointed leader of the food technology section (canning, freezing, dehydration and packaging). In 1967 he was appointed as an assistant chief (with John Christian) of the division of food research. In 1970, when the divisions of food and dairy research

“Kefford not only had ability as a research supervisor but also as a communicator of technical knowledge”

mid-1944 on "Some Aspects of Food Technology", a series of lectures held in the chemistry department of STC. The lectures were the catalyst that led Fritz Reuter to lobby for the transfer of the food technology diploma course to the NSW University of

were merged, Kefford became the officer-in-charge of the laboratory and also had responsibility for food laboratories at Hobart, Tasmania, Macquarie University and Gosford. In 1976 he joined the headquarters group as assistant chief (external relations)

to coordinate links with international bodies and retired in 1982. He published over 90 papers.

Widespread Influence

Kefford had strong links with the International Union of Food Science and Technology (IUFoST). He served on the executive from its establishment in 1970, ran the education committee and produced a world guide to courses in food science and technology. He served as secretary-general from 1978–87.

Jack Kefford was among the group of chemists and technologists that helped form an Australian Institute of Food Science and Technology in 1967. He was a member of the ad hoc committee set up in 1963 to explore the formation of an Australian institute and was present at the inaugural council meeting and general meeting in Shepparton in April 1967. He was a councillor for the Northern Branch and was elected unanimously as the first executive councillor. He became the third president (1971–73) following Vickery and Farrer. He was awarded the IFT Australian Award, the forerunner of the AIFST Award of Merit in 1961; fittingly, his award

address was titled “The Profession of the Food Technologist”.

During the past 45 years Kefford had an extensive involvement with the AIFST and the institute’s journal *Food Australia* (previously *Food Technology in Australia*). He was the senior editor of *Food Australia* from 1988–97 and until late 2011 he continued to play an invaluable role in reviewing and editing technical and research papers. The Jack Kefford Award for best paper published in *Food Australia* in the preceding year was instituted in 1993 to honour his contribution to food science and technology and to recognise members who publish technical and research papers. In the last few years he also made a significant contribution, together with his chemistry classmate Keith Farrer, to documenting the history of AIFST, in *Birth of a Profession: A history of the Australian Institute of Food Science and Technology*. Without them the full story would have been lost forever.

Jack Kefford was a fellow of AIFST, the Australian Academy of Technological Sciences and Engineering, the International Academy of Food Science and Technology and an honorary fellow of the UK and New Zealand Institutes

of Food Science and Technology. He was a great mentor to many young food scientists and technologists and has been universally described as patient, tolerant, loyal, cooperative and a caring individual concerned for the welfare of others who sacrificed his own research output for the overall benefit of the organisation. He was a gentle man and a gentleman in every respect. We are indebted to his wisdom, deep knowledge, subtle wit and conciliatory personality. These characteristics, blended with his sharp intellect, persisted even in his 96th year. He will be much missed by friends and colleagues.

Bess, his beloved wife of 66 years, died in 2006; members may recall their prowess on the dance floor at AIFST conventions. Kefford is survived by children Roslyn, Carol, Rod and Rick and their partners, twelve grandchildren and 19 great-grandchildren. 🍷

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A VERY SMART INVESTMENT

Providing nutrients to children has been named as the most cost effective method of improving lives around the world.

Words by Lynn Elsey

A Danish scientist recently asked a panel of five leading economists, including four Nobel laureates, to determine the most cost-efficient way of improving the world.

Their response? Fighting malnutrition through micronutrients.

Bjørn Lomborg, head of the Copenhagen Consensus Center and an adjunct professor at Copenhagen Business School, is interested in addressing some of the most pressing global challenges and assessing options for tackling them. As part of his quest he assembled a panel of noted economists and asked them to answer the following question: What would be the best way of advancing global welfare, and particularly the welfare of developing countries, if \$US75 billion of resources [15 per cent more than current aid spending] were at their disposal over a four-year initial period?

To help answer the question the panel was provided with copious amount of detailed research, undertaken by more than 50 experienced economists. The information covered 40 detailed investment ideas and included solutions covering a wide range of options for tackling an array of global problems including armed conflict, chronic disease, education shortages, hunger, population growth and water shortages. The ideas also detailed relevant costs and benefits.

Good economics

Based on the research and analysis provided, the panel selected 16



Finn Thilsted

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These investments are simply good economics

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cost effective investment options to best improve the human condition. Topping the list was increasing nutrient intake in preschoolers by providing micronutrients through fortification and supplements.

“One of the most compelling investments is to get nutrients to the world’s undernourished. The benefits from doing so – in terms of increased health, schooling, and productivity –

are tremendous,” said Vernon Smith, professor of economics and law at the Chapman University and Nobel laureate, a member of the expert panel.

The winning solution was underpinned by a research paper (“Hunger and Nutrition, Investments to reduce hunger and undernutrition” by John Hoddinott, Mark Rosegrant and Maximo Torero of the International Food Policy Research Institute) that


explored the potential of a \$US3 billion investment.

According to the paper, an investment of \$US100 per child could provide a bundle of interventions – including micronutrient provision, improvement in diet quality and behavior change programs – that could lead to a 36 per cent reduction in chronic under nutrition in developing countries. Each dollar spent reducing chronic under nutrition has a \$US30 payoff in benefits.

“In its simplest form, the central argument of this paper is that these investments are simply good economics,” the authors noted.

The authors estimate that around 163 million pre-school children are deficient in vitamin A and around 1.8 billion people are deficient in iodine. According to their research, it is possible to eliminate vitamin A deficiencies in pre-school children, eliminate iodine deficiency globally and dramatically reduce maternal anemia during pregnancy for less than \$US700 million annually.

“The Nobel laureates’ list shows us there are many smart investments that could help so much of the planet, for very little cost. These are the places that policy-makers and philanthropists should direct their attention,” Lomborg said.

The Copenhagen Consensus Center is a nonprofit, Denmark-based think tank that explores ways for governments and philanthropists to spend aid money. 

Lynn Elsey is the editor of food australia.

The 16 smartest ways to improve the global quality of life

According to the Copenhagen Consensus 2012 Expert Panel, the following investments are the most cost effective ways of improving life around the world:

1. Micronutrient interventions
2. Expanding subsidies for malaria combination treatment
3. Expanding childhood immunisation coverage
4. De-worming schoolchildren
5. Expanding treatment for tuberculosis
6. R&D to increase yield enhancements
7. Investing in effective early warning systems to protect against natural disasters
8. Strengthening surgical capacity
9. Hepatitis B immunisation
10. Providing those in poorer countries with low-cost drugs for acute heart attacks
11. A salt reduction campaign to reduce chronic disease
12. Geo-engineering R&D into solar radiation management
13. Conditional cash transfers for school attendance
14. Accelerated HIV vaccine R&D
15. Extended field trial of schooling benefits information campaign
16. Borehole and public hand pump intervention



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FREEKEH INSIDE

A super grain with a super potential

Words by Lynn Elsey

In the shadow of ambitious plans to make this country Asia’s Food Bowl, an innovative Australian project that seemingly has it all – a “super grain” loaded with nutritional and health benefits, produced through an efficient, easily exportable technology – has yet to attract the attention of the Australian government, consumers and farmers.

Ancient grains are riding a tsunami of interest as consumers discover their nutritional value, complex flavours and allergy-friendly properties. According to DataMonitor, global launches of new products made from super grains, such as millet, kamut and amaranth, have risen by more than 150 per cent since 2006.

The potential benefits from these grains were recently noted by the chief of the Food and Agriculture Organization of the UN, José Graziano da Silva, who said that neglected crops that are currently being underutilised could play an important role in addressing global food and agriculture challenges and should be re-evaluated.

Quinoa and chia appear to be topping the grain wave at present but according to many experts such as Tom Vierhile, innovation insights manager at Datamonitor, freekeh, a traditional food from the Middle East, is the grain to watch.

“It’s high in protein, fibre, resistant starch, vitamins and minerals, plus lutein and zeaxanthin. It’s a nutritional powerhouse,” Vierhile said.

The traditional process for converting raw grain into palatable food – a time and labour intensive process involving

picking young green grains (usually wheat) then parching, roasting in burning straw, thrashing and rubbing off the grain, in a process known as freekeh – has provided significant barriers to widespread commercial appeal.

However, if South Australian visionary Tony Lutfi has his way, the nutritionally-blessed freekeh will become a widely produced and consumed grain.

Improving on tradition

US-born Lutfi spent many years living and working in the Middle East, focusing on joint ventures and risk management along with other things such as working as an adviser to the Crown Prince of Jordan. A mechanical engineer by training, he had a ‘Eureka’ moment when he came across Jordanian freekeh being sold in Australia.

“I couldn’t believe that Australia, a country with masses of wheat,

“ There is unpublished research that suggests that the gluten in freekeh is different from normal gluten ”



Tony Lutfi

was importing a wheat product – complete with bugs and rocks – from Jordan, a country with very limited wheat production,” he said.

Lutfi decided to apply the technology he’d learned while working in the oil and gas industries to see if he could engineer a practical, cost efficient method of harvesting and producing freekeh for a broader market.

The freekeh process, which involves harvesting the grain while it is still green, results in a product that contains more protein, vitamins and minerals than most other wheat and grains which are produced at a later stage of maturity. The process also gives the grains a pleasant crunchy sensation and nutty flavor, making it an excellent accompaniment to a wide range of foods.

Non-milled grains have been a staple food in other countries, especially in the Middle East and Europe, for centuries. But Lutfi found little research had been done on freekeh, which has a number of different characteristics from other ancient grains.

“There didn’t seem to be any research investigating the differences between immature and mature grains,” he said. “And that the health and nutritional value in the green grain is completely different. It opens up a whole new area for research.”

So as Lutfi worked on developing a new technology to efficiently harvest and produce freekeh he also engaged some of the Australia’s key food research organisations including CSIRO, the University of Adelaide and the Australian Government Analytical Laboratories to investigate the nutritional properties of freekeh.

Along with nutritional benefits, freekeh had also been noted as an option for those who suffer from wheat intolerance and allergies. According to anecdotal evidence, some coeliacs have consumed freekeh without adverse or allergic reactions.

Lutfi said there is unpublished research that suggests that the gluten in freekeh is different from normal gluten which may eventually lead to a new classification: free from normal gluten. He hypothesises that the variation could exist because the gluten isn’t fully developed and the young grain lacks another amino acid that acts as a trigger to intolerance. It could also be a by-product of his company’s production process. Further research may help clarify freekeh’s potential in this area.

Super benefits

Although the jury is still out on some of the intolerance and gluten potential of freekeh, the nutritional and health benefits are backed by published research.

According to research undertaken by CSIRO, the Australian Government Analytical Laboratories, the University of Adelaide and Flinders Medical Centre, freekeh is loaded with the following attributes:



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*I believe we are developing an industry,
not just a company*

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- low in GI (43)
- low in carbohydrates
- a good prebiotic effect with a large number of biofidobacterial and lactobacilli
- high in fibre (up to 16.5 per cent), four times the level of fibre found in similar grains
- low in fat
- high in protein, more than found in couscous and rice
- rich in calcium, iron and zinc
- rich in zeaxanthin and lutein (implicated in the prevention of age-related macular degeneration)
- appreciable levels of nondigestible carbohydrates, suggesting that it is likely to have positive effects on bowel health and function, and
- is good for bowel health including managing irritable bowel syndrome.

The freekeh produced by Lutfi’s company, Greenwheat Freekeh, is also 100 per cent natural, free from chemicals, GMO, colouring, additives or preservatives.

Hitting the market

Because the green grains are high in moisture content, developing an efficient technology to produce a shelf stable product while retaining the grain’s high nutritional and taste benefits provided Lutfi with a challenge.

Lutfi utilised his extensive engineering background to develop a time and labour-friendly method of producing freekeh in order to make widespread production possible. The process, which took three years to perfect, is entirely natural and involves immobilising the enzymes in the grain without cooking it.

Lutfi says that his company is the only one in the world with an automated technology to harvest and produce freekeh. They currently produce a range of freekeh products including wholegrain and cracked grains freekeh. Through cooperation and co-branding with other manufacturers, mainly in the US, they



also market flours, breakfast and lunch cereals, water crackers and more. And, apparently, freekeh pizza is a hit in New York City.

Lutfi’s company is focused on co-branding ventures with other food producers, with an emphasis on using the Greenwheat Freekeh name as a key branding element – similar to the widely successful “Intel Inside” campaign Lutfi explained.

His overall goal, however, is not to be simply be a freekeh producer but rather to focus on marketing the

Greenwheat Freekeh brand and the unique technology through licensing and joint ventures.

“The goal is to become the Kleenex of the freekeh world,” he said

“Freekeh has it all: it is easy to cook, extremely versatile, safe, healthy and tasty,” Lutfi says.

Quite versatile, it can be used alone, in combination with other foods in salads, soups or even crab cakes, or as a base ingredient in foods such as pasta, breads, burgers and noodles. Its unique taste and nutritional properties

makes it suitable for enhancing the taste and health profile of other foods.

Although the Australian market seems a bit unenlightened about freekeh, other parts of the world have recognised its potential. Greenwheat Freekeh currently exports its freekeh products to the US, Canada and the UK. The Ukraine, another prodigious wheat producing country, has also seen the light. Greenwheat Freekeh currently is providing a muesli product for their market. Lutfi said that substantial interest in the processing technology is emerging from the US, Canada, Ukraine, Brazil and Argentina.

But although Lutfi has created an efficient method of producing a “super” food product that offers an array of health benefits, is kind to the environment and easy to farm, lack of interest and support from government and industry is styming the potential growth of the business and industry and stifling potential benefits to Australia.

Undaunted Lutfi continues to spread the word about the benefits of freekeh across to consumers, farmers and the government.

“I believe we are developing an industry, not just a company. What we have is potentially a Microsoft here,” Lutfi said. “It offers a way to change the way wheat and other grains such as rice is processed.”

Lynn Elsey is the editor of food Australia

Freekeh
Nutritional Component - One serving 42grams

	Quinoa	Brown Rice	Farro	Freekeh
Calories	155	170	170	150
Total fat	1.3g	2g	1g	1.5g
Total carbohydrates	30g	38g	35g	30g
Dietary fibre	3g	2g	5g	6g
Protein	5.5g	4g	7g	6g
Calcium	0mg	0mg	2mg	25mg
Iron	2%	2%	1%	2.2mg



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THE GLUTEN FREE CONUNDRUM

As the interest in gluten free foods continues to skyrocket, many are baffled about its popularity

Words by Lynn Elsey

According to recent reports, 18 per cent the population is now buying gluten free products, a 28 per cent increase from 2008–2012. In the US alone the market for gluten free products was around US\$4.2 billion in 2012 and estimated to reach \$6.5 billion by 2017, according to research company Packaged Facts. The total number of new products claiming to be gluten free in the US increased from around 600 in 2007 to more than 1,600 in 2011 according to Mintel research.

These numbers will come as no surprise to anyone in Australia who has wandered the aisles of their local grocery store, perused the menu at any café or restaurant or worked in an office with a communal kitchen in the past few years, especially where females are in abundance.

O'Malley, a media relations manager for the Academy of Nutrition and Dietetics, said that the organisation did not recommend gluten free diets for weight loss and "we advise that only those that have a gluten intolerance or have celiac disease should eliminate gluten from their diets".

The numbers

The US Center for Celiac Research reports that less than 0.1 per cent of the population has been confirmed with a celiac disease diagnosis and estimates that overall 1 per cent of the US population actually suffers from celiac disease. It also has found that 6 to 7 per cent of population has a wheat/ gluten intolerance "whether perceived or otherwise".

Similar numbers have been reported

engender the same long-term damage to the intestine that untreated celiac disease can cause."

Coeliac Australia provides similar statistics to the Center for Celiac Research, finding that 1 in 100 Australians suffer from celiac disease, although 75 per cent of these people currently remain undiagnosed.

So, how does one explain the popularity of gluten free, above and beyond those who have clinical health issues?

Many are pointing fingers at celebrity endorsements, unscrupulous dietitians and nutritionists, avoidance of proper medical diagnosis and, more generally, good marketing and bad science.

Packaged Facts conducted a US survey in August 2012 asking people why they purchased gluten free products. The responses included:

- they are healthier: 35 per cent
- to manage my weight: 27 per cent
- they are generally low-carb: 21 per cent
- a member of my household has a gluten or wheat intolerance: 15 per cent
- a member of my household has celiac disease: 7 per cent.

The Science

According to Pamela Cureton, clinical research dietitian at the Center for Celiac Research, there is no scientific basis behind the popular concept that a gluten-free diet will help individuals lose weight and improve their health (in the absence of celiac disease).

She said that research has found that "people on gluten-free diets often gain weight, as many gluten-free foods are

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It's an industry based on a false premise

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The explanation for the rapid expansion is somewhat baffling to many within the food industry – especially in regards to the actual number of people who have been clinically or even self-diagnosed with celiac disease or wheat/ gluten intolerance.

One factor seems to be the perception that following a gluten free diet will lead to weight loss. Indeed a recent US poll of registered dietitians predicted that gluten free diets would be the most popular diet option in 2013. In response to the survey Ryan

the University of Maryland Center for Celiac Research, which claims that nearly 1 out of every 133 Americans suffers from celiac disease. The centre is keen to clarify the difference between celiac disease, an autoimmune disease, and gluten sensitivity. The center has recently published research showing that gluten sensitivity is: "a different clinical entity that does not result in the intestinal inflammation that leads to a flattening of the villi of the small intestine that characterizes celiac disease. Researchers believe that gluten sensitive reactions do not

quite calorie dense.” She also noted that gluten-free diets are often higher in fat and lower in vitamin B12, zinc, iron and folate. But the gluten free trend seems to be gaining momentum she said during a presentation at the Whole Grains on Every Plate conference in Texas in October 2012.

Cureton’s comments are mirrored by Glenn Gaesser, professor and director of the Healthy Lifestyles Research Center in the Arizona State University (US) School of Nutrition and Health Promotion. Gaesser recently published an article in the *Journal of Academy of Nutrition and Dietetics* (September 2012) that showed that undertaking a gluten

Google ‘gluten-free diet’ you’ll get more than 4.2 million results. Celebrities endorse it, and there are hundreds of books being published on it.

“But the only reason you would lose weight is that you’re cutting calories.”

“However, there are indications that gluten may contribute to blood pressure control and immune function, and may create a healthy composition of colon bacteria.”

Gaesser said that a gluten free diet often leads to weight gain because many gluten free products have more added fats and sugars than other products.




“ *Only those that have a gluten intolerance or have celiac disease should eliminate gluten from their diets* ”

free diet was not an effective method of losing weight, and that some data suggested that gluten might be the source of health benefits.

“It’s an industry based on a false premise,” Gaesser said. “It’s become such a popular notion that if you


“This paper is one of the first to look at the other side of the gluten craze. Far too many Americans are following the diet for reasons that simply do not make sense. It’s time to listen to the science.”


Lynn Elsey is the editor of food Australia



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Value through expertise




THE DOCOSAHEXAENOIC ACID (DHA) OXFORD LEARNING AND BEHAVIOR (DOLAB) TRIAL

A new study showed that Algal DHA improved reading and behaviour in underperforming school children.

Words by Hua Jing

A new study in *PLoS-ONE* (in press) reported that supplementation with 600 mg algal DHA for 16 weeks improves reading and behavior in healthy, school-aged children with low reading scores. This study comes at a time when many school-aged children lack sufficient reading skills. According to the most recent report card by the US National Assessment of Educational Progress, many school-aged children struggle with reading, the most fundamental educational skill. Because early reading skills provide the foundation for children's academic success and poor readers are not only at risk of developing academic problems but also social and behavioral problems, identifying strategies to improve reading is imperative.

Why DHA?

As the brain continues to grow and develop throughout childhood and adolescence, maintaining brain health through good nutrition is critical. DHA is a major structural fat in the brain, accounting for up to 97 percent of the omega-3 fatty acids in the brain. Furthermore, DHA is a nutrient critical for optimal brain development and cognitive function throughout life. DHA is therefore important for children and their developing brains. Accumulating

evidence from epidemiological and intervention studies suggests that low dietary intakes of long chain omega-3 fatty acids, and DHA in particular, may have a detrimental effect on children's behavior and cognitive development.

Additionally, dietary supplementation with long-chain omega-3 fatty acids, including DHA, may benefit child behavior and learning, including reading and spelling. Unfortunately, the potential benefits are often not realised because DHA intake by children is low due to limited availability of DHA in foods customarily consumed by children, resulting in a shortfall in DHA consumption. Because average daily intake falls well below amounts recommended by national and international authorities, a DHA dietary supplement and foods fortified with DHA represent viable alternatives to increase DHA consumption.

To determine the effects of algal DHA supplementation on reading, memory and behavior in healthy children in mainstream classes, Alexandra Richardson and Paul Montgomery initiated and conducted the Docosahexaenoic Acid (DHA) Oxford Learning and Behavior (DOLAB) Trial (DSM Nutritional Products, formerly Martek Biosciences, provided product and funding). This randomised, double-blind, placebo-controlled trial

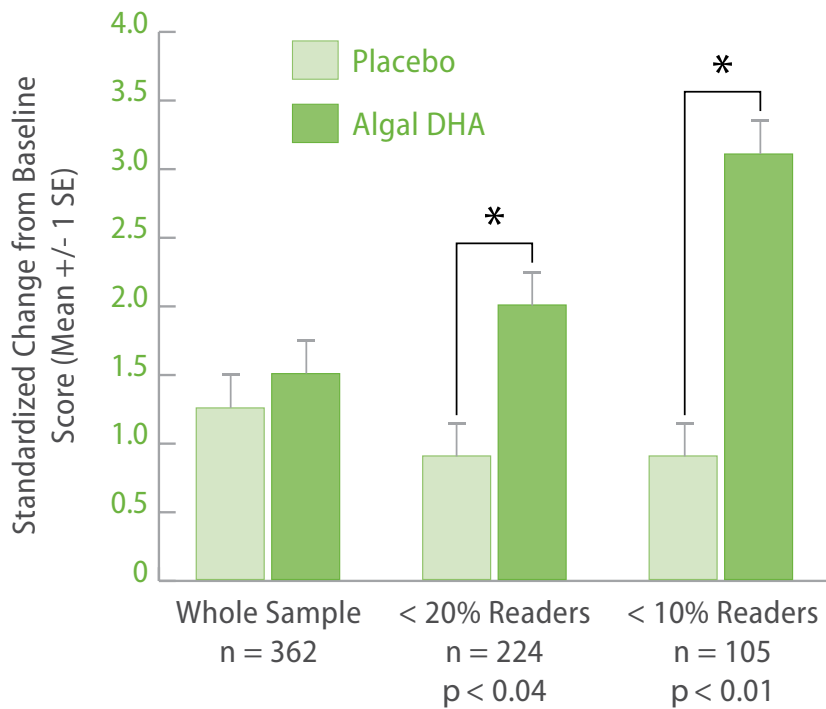
investigated the effects of algal DHA supplementation on reading, working memory and behavior in healthy school children.

A total of 362 healthy children who were underperforming in reading (below the 33rd percentile) were enrolled in the study. Reading performance was evaluated using a standardised reading test, the British Ability Scales (BAS II). Children were randomly given either algal DHA, at a dose of 600 mg/day, or a matching placebo for 16 weeks. The primary outcome measures were changes from baseline in reading, working memory and behavior. Reading and working memory were assessed using the BAS II and behavior was assessed by both parents and teachers using the Conners' Ratings Scales (CPRS and CTRS respectively). CPRS and CTRS are highly valid and reliable scales of child behavior over several domains.

Reading Results

Results from the DOLAB Trial found that the supplementation did not impact the group overall. However, it did find that the 224 children with baseline reading scores <20th percentile, who received algal DHA supplementation had significantly improved reading levels. Reading levels were also significantly improved in the subgroup

Figure 1

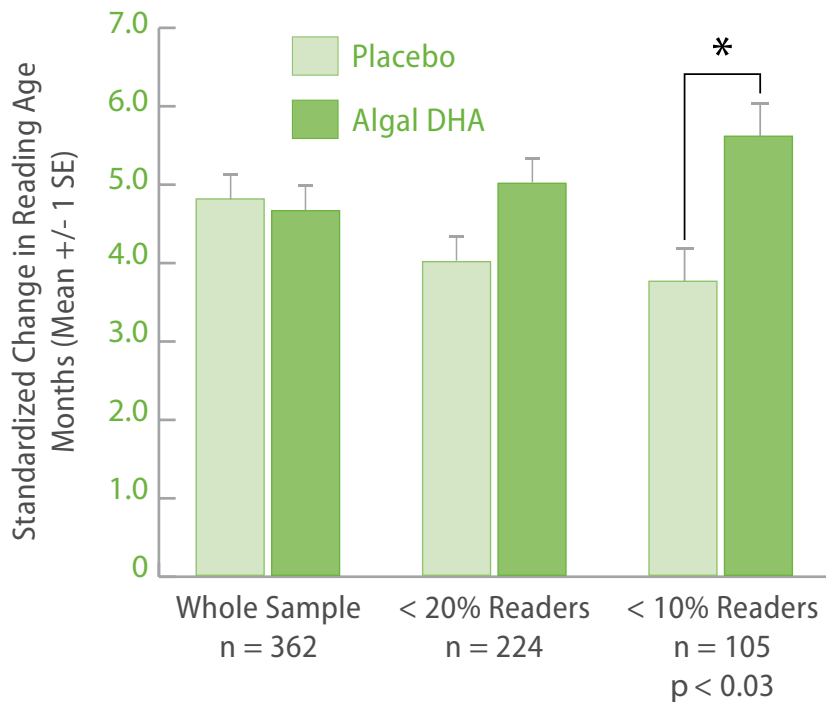


with baseline readings scores <20th percentile. In children with baseline reading scores <10th percentile, algal DHA supplementation led to an additional 1.9 month gain in reading age (approximately 50 per cent greater than expected) (Figure 2).

Behavior Results

After 16 weeks of supplementation, algal DHA significantly improved behavior as rated by parents. Compared to children given placebo, children given algal DHA experienced significant improvements in eight of 14 scales of the CPRS (Figure 3, page 28). Algal DHA supplementation had no effect on teacher-rated behavior. Disparities between teacher and parent ratings of child behavior are common. Parents might be more sensitive than teachers or other professionals to any changes in their children’s behavior over a short intervention period.

Figure 2



Working Memory Results

There were no significant effects of algal DHA supplementation on working memory, although a trend toward better scores was observed.

Relationship of DHA Status and Learning

Fatty acid content was determined in the whole blood of the participating children in order to investigate the link between DHA status and reading, memory and behavior. An initial baseline analysis of the children’s blood DHA concentrations established that higher DHA levels were associated with better reading and working memory performance as well as better parent-rated behavior in otherwise healthy children. Higher blood DHA levels were also found to be associated with fewer sleep problems (parent-rated) and less anxiety (teacher-rated). The details of this relationship are forthcoming.

of 105 children with baseline reading scores <10th percentile (Figure 1).

Standardised scores on the BAS II reading test correspond to a reading age (reported here in months). In general, children’s reading ages typically increase by four months over a 16-

week period. When comparing reading ages, results from the DOLAB Trial found that supplementation with 600 mg algal DHA for 16 weeks led to an additional 0.8 month gain in reading age (approximately 20 per cent greater than expected) in children

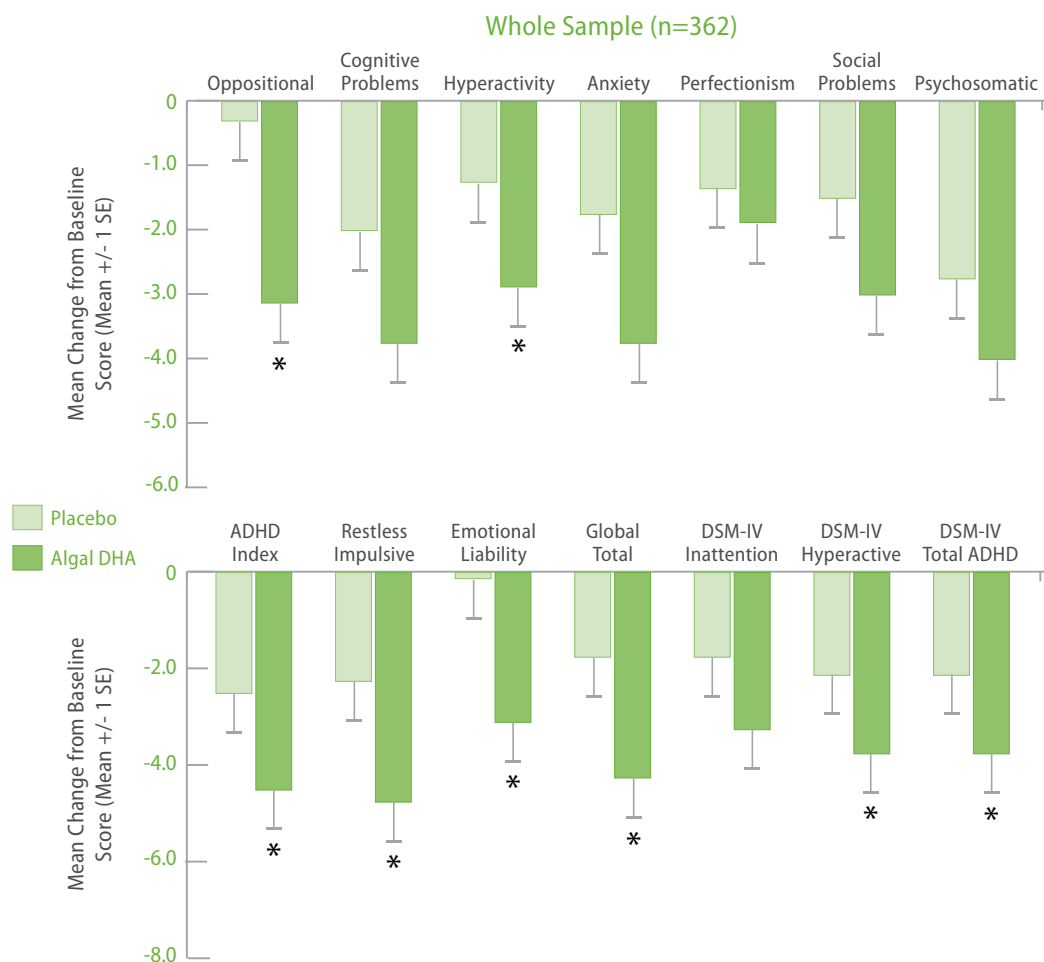
Conclusions

For children with baseline reading scores <33rd percentile:

- Supplementation with 600 mg algal DHA for 16 weeks had no effect on reading



Figure 3



- Supplementation with 600 mg algal DHA for 16 weeks significantly improved parent-rated child behavior

For children with baseline reading scores <20th percentile:

- Supplementation with 600 mg algal DHA for 16 weeks significantly improved reading
- Supplementation with 600 mg algal DHA for 16 weeks led to an additional 0.8 month gain in reading age

For children with baseline reading scores <10th percentile:

- Supplementation with 600 mg algal DHA for 16 weeks significantly improved reading
- Supplementation with 600 mg algal DHA for 16 weeks led to a significant, 1.9 month gain in reading age.

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Hua Jing is a nutrition science and advocacy manager for DSM Asia Pacific.

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GOING TO EXTREMES

When it comes to customer personalisation, Absolut has taken packaging to a whole new level.

Words by Lynn Elsey

Vodka specialist Absolut has upped the ante on unique packaging. The company recently launched a new line of Vodka with a rather expensive production twist – the nearly four million bottles involved will all have a completely different design.

Along with creating an array of new designs, the project also meant developing a whole new production line to engineer an estimated four million individually designed and decorated bottles. And, in addition to ensuring that the 38 different colour and 51

bottling manufacturer Adargh. The development team at its Swedish glass plant had to completely overhaul a system created to minimise design variation – into something that needed to do the opposite.


“After a few meetings and brainstorming sessions we developed a computerised valve and control system to automatically and continually change colours and spray patterns on the bottles”, said Fredrik Källqvist, Ardagh’s development manager for Sweden and Denmark.

artist’s studio that a bottle factory.

“Our customers are all unique – so we wanted to give each a one-of-a-kind bottle that is an individual as they are. We loved the concept. Making it happen was the hard part.”

Locally, as well as globally, the effort seems to have paid off. According to the company’s Australian public relations spokesman, Mark Cavanagh, the individually designed vodka bottles have been the most successful limited edition vodka products that the company has produced.

“The technology that has led to four million bottles produced has really struck a chord with people. I guess it allows for a pleasing element of personalisation,” Cavanagh said.

Although the company has declined to provide cost figures for the new production line, it has noted that Absolut Unique is being sold at the same price as the company’s classic vodka. 

“ *The production line looked more like an artist’s studio that a bottle factory* ”

pattern options were implemented in a completely different way, each bottle also needed to have a unique number included on the label.

The result is a new assembly line that, according to a Mattias Elg, a quality management professor from Linköping University in Sweden, can produce up to 94 quintillion (94 x 10 to the 18th power) different bottle versions from one line.

“Absolut Unique is a daring concept, even for a company as passionate about creativity as Absolut,” said Jonas Tåhlin, the vice president for global marketing at Absolut Company. “Anyone could do one or two unique products. We’re making close to four million.”

Creating four million unique products from a single production line posed quite a challenge to the company’s

The team also developed a system to randomly add contrasting splashes of colour to the bottles during the coating process.

“We further introduced new functionality on the screen printing machine for randomising the print start for each printing station in the machine,” Källqvist said. The team also developed a screen and colour changing scheme printing process to balance variation and productivity and established systems that allow the bottles to be mixed during and in between the production process, to further increase variation.

“Absolut Unique feels a bit ‘mad scientist’, a bit street art,” Tåhlin said. “When the bottles first appeared on the conveyer belt, we cheered. By that point the production line looked more like an



Lynn Elsey is the editor of food australia.



BIO PACKAGING

Is food the new plastic? A number of new products are using food as a basis for packaging.

Words by Lynn Elsey

Packaging with corn

Australian company Plantic Technologies is making significant inroads into the world of biodegradable and renewable sourced packaging for the food industry through the use of field-grown crops.

The company's bioplastic packaging is being used by a number of domestic and international food producers and retailers, from flautas and burritos in California to beef for Coles in Australia.

The Victorian-based company manufactures bioplastic packaging based on non-GM corn, with all byproducts going to animal food and fertiliser. Its goal is to provide bioplastics with all the functions of conventional, petrochemically-derived plastics in an economical and eco sensitive way. Minimal crop space is required and the crop has no impact on food growing requirements, due to a highly efficient conversion rate.

The technology is based on high-amylose cornstarch, derived from specially grown, non-GM hybrid corn supplied by Corn Products International.

During development, water solubility provided a challenge for use in applications such as meat packaging so the company developed a process of sandwiching the corn-based product between two thin layers of traditional plastics. This provides a product that can accommodate moist foods and has low gas permeability.

The packaging involves a core layer that is extruded in a conventional manner. Additional layer or 'skins' of polyethylene (for heat-sealing purposes) and polypropylene (for moisture barrier) are laminated to the core layer. The oxygen transmission rate

is less than 0.05 CC/sq m/24/hr at 23 C, according to the company.

The packaging, which has been certified by Vincotte to have up to 89 per cent renewable content, is not biodegradable due to the non-biodegradable skin layers around the starch core. The cost is comparable to other conventional plastic packaging materials according to the company.

Coles was the first Australian supermarket to adopt the company's eco Plastic technology and is using the trays for pre-packaged beef, veal, lamb and sausage products. Coles expected to purchase more than 95 million trays in 2012.



"The Plantic eco Plastic tray is a quality product that has real business and environmental benefits," said Allister Watson, Coles general manager Meat Delicatessen and Dairy.

Plantic grew out of a CRC for International Food Manufacture and Packaging Science. It was established in 2002 and purchased in 2010 by Gordon Merchant (the founder of Billabong surf wear).

According to Plantic's CEO Brendan Morris, the company is working towards a fully biodegradable version of eco Plastic. Morris has said that the potential market for the product was \$7 billion worldwide.

The mushroom effect

Corn isn't the only food that is finding its way into packaging. Mushrooms are also shooting up as eco-friendly alternatives to traditional products.

Sealed Air has released Restore, a 100 per cent renewable protective package made from non-food agricultural byproducts and mycelium, the branched, tubular filaments of fungi (mushroom roots), into the US market. This is the first commercialisation of the technology developed by Evocative Design. The technology uses mycelium to bind agricultural waste into a natural, protective moulded shape.

The company says that the new product performs as well as traditional materials, is home compostable and cost neutral. The mycelium is mixed with regionally sourced agricultural waste and grown indoors, without the need for light, watering or petrochemicals.

Mycelium has also been pegged as a method of combating food

spoilage and extending the life of fruit and vegetables. Oliver Poyntz, a freelance industrial designer in the UK, has published a patent for a living mycelium tablet insert, Fresh Plus, that he says can be placed inside food packaging to reduce the concentration of oxygen, through respiration, and increase the carbon dioxide levels. This allows the insert to inhibit the rate of respiration of fruit, vegetables and microorganisms that can cause food spoilage. It also enables fruit and vegetables to ripen more slowly.



The insert, which is encased in a perforated polymer film, contains a microorganism that can be grown on agricultural or industrial waste.

The patent claims that the package can be resealed after opening as the insert will continue to adjust carbon dioxide levels. It also said that the inserts keep food fresher for at least two days longer than standard packaging, an option not available with other modified atmospheric packaging products.

Poyntz has said that he hopes that his innovations will help to reduce the 25.3 million tonnes of food waste that the UK produces each year.

On the Other Hand


While biodegradable, environmentally focused packaging is steaming ahead, some traditional materials are increasingly under fire.

BPA (chemical bisphenol A), a frequently used coating and manufacturing substance, is never far from the headlines with its reputed links to health problems, including cancer and asthma. The French parliament has just ratified plans to ban BPA (including the manufacture, import, export and commercialisation

of all food packaging) in baby food products in 2013 and all food containers by 2015.

However, a team of US scientists has just published an article in the December *PLoS One* (ref: doi:10.1371/journal.pone.0051086) that not only found no links between BPA and heart disease and diabetes but also challenged a commonly used measurement, the National Health and Nutrition Examination Survey (NHANES), for testing BPA levels.

The research concluded that studies based on NHANES data, which involves a single measurement, shouldn't be used to determine the actual effect of exposure to BPA and similar substances. The authors said that chemicals such as BPA may have a short half-life and may not be represented over the longer term.

"We need to expend resources on appropriately designed epidemiologic studies and toxicological explorations to understand whether these types of chemicals play a causal role in chronic diseases," the authors concluded. 

Lynn Elsey is the editor of food australia.

A little is enough Using technology to make more from less

Ballantyne's innovative range of cheese and butter concentrates gives food technologists more freedom to create cost-effective products with real dairy profiles. This concentrate processing technology releases the full flavour potential of premium Australian dairy ingredients.

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QUESTIONS & ANSWERS



Sutasinee Anantanawat

Anantanawat is a research officer (food science) for SARDI, South Australia's principal research institute in Adelaide. She obtained a bachelor of nutrition and food sciences degree from the University of South Australia in 2009 and was the recipient of the AIFST 2012 Malcolm Bird award, which recognises young members who demonstrate academic achievement, leadership and integrity in the profession.

Q Why did you decide to study food science?

A I originally wanted to do veterinary science but that would have meant moving to Perth or Melbourne, which I didn't want to do at the time. But because I loved food and science I decided to study food science.

Q Did you get any industry experience while you were studying?

A Yes, during my second year I did work experience with Qantas Q catering in Adelaide. It was really cool; I did a lot of things including helping with an internal audit, sensory analysis, creating labels for food packages, taking food samples and I got to go on the runway and on the plane when all the passengers left.

Q Has membership in AIFST been useful?

A Definitely. I have met a lot of people and made a lot of contacts. It has been really good for my career, helped in my professional development and also helped me become more organised.

Q Was it difficult to get a job after graduating?

A Actually, no. At the end of my third year I got a casual job as a technical officer at SARDI. I was fortunate that it turned into a full-time role.

Q How was winning the Malcolm Bird Award?

A Great. I was really surprised at the wide exposure I received during the convention.

Q What exactly do you do at SARDI?

A Many things. I help out with research projects, including getting involved in experimental design, running sensory analysis panel, the actual lab work and writing funding applications. I presented one of my projects, on oyster research, for the Malcolm Bird Award.

I have also worked on a semi-qualitative risk assessment of potentially harmful parasites in Australian finfish project funded by the Australian Seafood CRC. We've just finished the report and publication is due shortly.

Last year I worked on a funding application for the Seafood CRC to produce a user-friendly guide for the seafood industry to help identify and assess potential food safety hazards and shelf-life attributes for novel seafood products. We've now received funding so, primarily, I am working on this project.

Q Your job seems to entail a lot of research, were you always interested in this aspect of food science?

A When I was at uni, I really didn't like it. But now that I am involved in research, I really enjoy it. The real fun part is knowing the results before everyone else does.

Q What is the best thing about food science?

A You get free food (she laughs). Also you learn a lot more about food, you learn how to read labels and understand what actually goes into food.

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FUNCTIONAL FOODS ROUNDUP

A desire for fewer ingredients, convenience and addressing health claims are some of the expected trends this year.

Words by *Ranjan Sharma*

Healthy food trends for 2013

It's the time of the year for predictions regarding what is going to be hot in the year ahead. Although it is almost impossible to predict what consumers are likely to choose, here is what is likely to succeed in healthy foods in 2013.

1. Increased consumption of plant-based products and a decreased consumption of animal products.

This trend can partly be attributed to the drought in northern hemisphere, leading to the increased cost of meat products, and partly to consumers' recognition of the adverse health effects of eating excessive meat. US-based Phil Lempert, aka the Supermarket Guru, predicts a shift toward meatless proteins such as eggs, nut butters, tofu, beans and legumes. This means 2013 will bring more plant-based products and increased opportunities for established vegetarian and vegan brands such as Sanitarium's Vege Delights and ConAgra's Lightlife.



2. *A focus on sustainably produced products.* Now that environmental issues have come to the forefront, the word sustainability is being hammered across food processing companies including raw materials such as coffee beans from the rainforest, palm oil from South East Asia or the packaging material across the product range.

In 2013, packaged food will come under more scrutiny for its lifecycle attributes. This means there will be more marketing of products that help minimise a negative environmental impact.

3. Minimisation of ingredients.

In 2013, manufacturers will find that consumers are spending extra time checking the list of ingredients. Those who have little knowledge or time to decipher the codes for food additives will opt for products with least number of ingredients. This will create extra headaches for food companies as formulating with minimum ingredients may not always result in the desired product functionality.

4. Convenience is still the key.

Convenience of packaged foods for consumers is unlikely to dissipate in 2013 as more people become time poor. For food processors, the production of more convenient foods sometimes means compromising the nutritional benefits.

5. Seeking new salt alternatives.

Salt reduction and a search for salt

alternatives in packaged foods are continuing trends for 2013. This is hardly surprising as most of us are consuming significantly more salt than the recommended levels. Recent Heart Foundation research has shown that, on average, children are eating around 6g of salt a day; a level recommended for adults. Similarly, adults are consuming over 50 per cent more than the recommended daily intake for salt.

6. Demand for natural ingredients.

While the hype around the natural products has somewhat dampened, this trend is still likely to be active in 2013, especially for food additives such as colours and flavours.

7. Health claims on packaged food products.

Will this be a year when Australian manufacturers start making and streamlining health claims on packaged foods? As the process for the approval of the Nutrition and Health Claims proposal from Food Standards Australia New Zealand has now been completed (FSANZ Standard 1.2.7), companies have opportunities to start developing strategies to make health claims on packaged foods (see below for more details).

8. Demand for products with non-allergic ingredients.

The demand for non-allergic ingredients (e.g. gluten- and peanut-free ingredients) has been on the rise for past five years and it is unlikely to slow down in 2013. As most large processing companies deal with

multiple food ingredients from global suppliers and complex manufacturing processes, producing allergy-free products remains a challenge. Inadvertent presence of allergenic ingredients can have large financial implications if the products are recalled. In this market smaller manufacturers have some advantage as they can better control the ingredients and processes than larger manufacturers.

moisture-rich products to extremely high hydrostatic pressures (400-600 MPa), thereby inactivating pathogenic bacteria. The success of this technology is evident from BevNET's Best of 2012 awards for new products and beverages. In this year's juice category, 4 out of 10 winners were juice products processed using HPP. These are Evolution Fresh (Best Product), Harmless Harvest (Best Coconut

a low throughput, which remains an unattractive proposition to large processing companies.

An interesting way of formulating nutritional products is being offered by Alcrea Health in the US (www.formulationstation.com). Using Alcrea's web-based Formulation Station, custom-branded nutritional formulations can be made by consumers. Users can browse and modify existing formulas to develop custom products with their own ingredient levels and dosage forms. At the click of button the user submits a unique formulation for review by an Alcrea Health scientist and generates a request for purchase. Although it seems like a user-friendly approach, the assumption that customers are familiar with bioactive ingredients seems farfetched. And although Alcrea Health staff claim to scrutinise the final formulation, there is a danger that customers will start marketing products with unsubstantiated health benefits.

“ This will create extra headaches for food companies, as formulating with minimum ingredients may not always result in the desired product functionality ”

9. Increased snacking and mini-meals as portable nutrition. US based NPD Group research has found that people are eating fewer items per meal but are snacking more, a trend likely to continue in 2013. Phil Lampert links this trend to health professionals recommending smaller portions that aid in better utilisation of nutrients. Convenience of smaller packs may also be a contributing factor. In Australia, snack as meal products similar to One Square Meal from Sanitarium and Duets from Yoplait and are likely to benefit from this trend.

10. Children nutrition a top priority. Child nutrition remains a priority for most parents who regularly shop at supermarkets. Parents might ease up a bit when eating out but when it comes to buying packaged foods, products with 'healthy' nutrition messages are likely to fare better in 2013. Products in this category are likely to include yogurts, organic foods, and products with wholemeal.

Innovations

High pressure processing (HPP), as a tool for producing fresh-tasting, nutritionally superior beverage has gained popularity in successful new products in the last few months. HPP involves isostatic compressing of

Water), BluePrint (Best Juice) and Suja (Best Functional Beverage). In Australia, the HPP processed food category is a small but growing trend with recent launches of fruits juices, ready to eat meat products and avocado-based products. The main limitation for growth of this category remains the large capital cost for installation and



Regulations

The ministerial council has finally approved the Nutrition, health and related claims proposal from FSANZ. This will be implemented as Standard 1.2.7, Nutrition, Health and Related claims, and will become law in early 2013. Food businesses will have three years to meet the requirements of the new Standard. Nutrition content claims and health claims are voluntary statements made by food businesses on labels and in advertising about a food. The new standard is designed to help reduce the risk of misleading and deceptive claims about food, expand the range of permitted health claims, encourage industry to innovate, giving consumers a wider range of healthy food choices and provide clarity for the jurisdictions enforcing the Standard. Companies will need to ensure that health claims, such as 'low fat' and 'high calcium' only appear on healthier foods while foods containing higher levels of saturated fat, salt and sugar will not be able to claim health benefits. ⑤

Ranjan Sharma, the editor of Functional Foods Weekly, www.functionalfood.biz, has more than 20 years experience in food research, innovation and commercialisation.



A DARK STRAWBERRY MAY HOLD INCREASED HEALTH BENEFITS

A Queensland breeding program has identified a new “super” strawberry, which may not only offer benefits to consumers but also to farmers and processors through premium prices.

Words by Kent Fanning, Michael Netzel, Mike Gidley, Damien Pruneau, Mark Herrington

A recent publication titled “High anthocyanin strawberries through cultivar selection” (*Journal of the Science of Food and Agriculture*) generated a significant level of media interest in the potential development of a so-called super strawberry.

The project came about through collaboration between research scientists from a range of disciplines including horticultural breeding and phytochemical analysis.

The Queensland Department of Agriculture, Fisheries and Forestry (DAFF) breeding program, supported by Horticulture Australia Ltd (HAL), Strawberries Australia Inc (SAI) and federal and Queensland governments, allows strawberry food producers to continue supplying delicious strawberries to the community.

However, consumer requirements and the production environments for strawberries are continually changing. As an analogy, the same situation happens with cars and electronic devices where changes in consumer and production environments result in new models being designed so that

they match production and market. In the same way the DAFF breeding program continually develops new varieties (models) of strawberry to meet the changing production and market environments.

One exciting outcome of such breeding is that characteristics that were often previously hidden away in the genetic background become apparent. In our program, one such hidden treasure that has arrived is a darker fruited type.



The study

As members of the project team were examining other pigmented fruits and vegetables (including plums, sweetcorn and purple carrot), where colour was related to the content of specific

pigments, these darker breeding lines were hypothesised to have higher pigment levels. Similar to plums, other berries and purple carrots, the major pigments in strawberries are anthocyanins.

The primary aim of the project was to compare the anthocyanin content in a dark breeding line (named BL 2006-221) with five commercial varieties and two other breeding lines. The content of vitamin C and specific phenolic acids was also measured together with the antioxidant capacity. The major finding of the project was that BL 2006-221 had an anthocyanin content of approximately 100mg/100g, which was nearly double that of the highest commercial varieties tested.

Recent publications indicate that consuming fresh or processed strawberries (e.g. as juice, drink, puree or powder) may exert beneficial health effects. Emerging evidence from epidemiologic and interventional studies indicate that anthocyanin/polyphenol rich strawberries and derived products may exert protection against inflammation, oxidative stress,



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type 2 diabetes, cardiovascular disease, oesophageal cancer, and obesity in humans.

Furthermore, anthocyanins and other polyphenols from blueberries and strawberries may also contribute to the prevention of hypertension in men and women (as suggested by Cassidy and colleagues). There is growing evidence that the observed protective effects of dietary strawberries are correlated to their anthocyanin/polyphenol composition and content. Anthocyanins, one of the major polyphenol subclass, are quantitatively the most important polyphenols in strawberries and strawberry products.


Although more than 25 anthocyanin compounds have been identified in different strawberry cultivars to date, the most common are pelargonidin-3-glucoside (77–95 per cent of total anthocyanins) followed by pelargonidin-3-rutinoside and cyanidin-3-glucoside. These natural pigments are interesting not only because of their reported potential health benefits but also because of their characteristic colour attributes. The genotype, processing technology and storage conditions can all have a significant effect on the content of anthocyanins and other polyphenols in strawberries and derived products.

In the study, the colour (as defined by hue angle) of the strawberries was measured using a chromameter and correlated well ($r^2=0.69$) with anthocyanin content for the strawberries studied. The use of a chromameter to screen out lower anthocyanin strawberries may enable faster evaluation of future breeding selections by avoiding the more time and cost intensive high performance liquid chromatography analysis.

In the current DAFF breeding program, crosses have been undertaken to develop high flavour in dark lines. This will continue in 2013. Anthocyanin analysis of these crosses will be concurrently undertaken with the field assessment and sensory analysis as the program develops.

Consumer testing will be a key element of the work to be done regarding the commercial potential for a high anthocyanin strawberry. The initial aims of this would be to examine attitudes of consumers to such a strawberry when the information about anthocyanin content and health profile is communicated. Additionally, potential communication strategies, trial product placement and information on pricing are all scheduled for investigation.

The darker strawberries would be visually different from existing commercial varieties. This could be beneficial in the development of a differentiated premium strawberry for those consumers who are willing to pay more for potentially increased health benefits from the higher anthocyanin content. For example, the Vital Vegetable range premium horticultural products from New Zealand charge a premium for their increased phytochemical content.

This project was funded in part by HAL using the strawberry industry levy and matched funds from the Australian Government. 

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Charissa Fredericks (University of Queensland) undertook most of the analysis at the Health and Food Sciences Precinct (a joint Queensland Health/DAFF/CSIRO facility located in Brisbane) as part of her university honours year. The other members of the research team were Mike Gidley (UQ), Kent Fanning (DAFF), Mark Herrington (DAFF), Michael Netzel (CSIRO Animal, Food and Health Sciences/DAFF/UQ), Gabriele Netzel (UQ) and Dimitrios Zabarar (CAFHS).



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HEALTH AND NUTRITION FOR OUR AGEING POPULATION

New research highlights the importance of updating nutritional and health practices for the elderly.

Words by Cally Matthews

On 24 October 2012, ILSI SEAR Australasia and the Omega-3 Centre brought together a team of experts to deliver a one-day symposium on health and nutrition in our ageing population in Melbourne. The following are highlights from the day.

Sandra Capra (University of Queensland) started off by noting the importance of interpreting dietary guidance systems in context, since such guidelines are based on a well population. Ageing populations contain groups who have chronic diseases, take medications and often are frail; current dietary guidelines may be inadequate for their needs. The challenge is to provide a diet that is nutrient dense but contained in smaller amounts of food while remaining palatable and acceptable. Capra finished with a thought-provoking illustration, comparing two nutritionally-equal options: a cupcake with a dollop of cream, representing 500kJ, 2.5g protein, 6g fat, 15g carbohydrate and 0.4g fibre, and a slice of white bread with 1.5 tsp of butter – which is more enjoyable to eat?

Dietitian Georgie Rist from MyGene reported from a study she conducted that showed that 8 per cent of community-based people aged 65 years and over who receive home nursing care have malnutrition, with a further 35 per cent at risk. Community-based elderly who are malnourished have a reduced quality of life, are more likely to be admitted to hospital or seek help from a GP and are less likely to recover from

the effects of malnutrition than the well-nourished elderly. Yet mixed messages pervade the public health agenda. A case in point is the strong message about avoiding saturated fats in regards to high cholesterol, which has resulted in some older adults avoiding high fat foods when they need to increase their calories. Since community living older adults are not routinely tested on their nutritional status there is a need to address nutrition concerns in this vulnerable group.

Dr Les Cleland (Royal Adelaide Hospital) presented recent investigations which showed fish oils to be effective in the treatment of rheumatoid arthritis (RA) by decreasing tender joint pain and the duration of morning stiffness. However since no single medicine is effective in treating RA, fish oils should be used in combination with other medicines appropriate to the stage of the disease.

David Colquhoun (University of Queensland) commented on a number of well-conducted trials with strong results and gave the example of the GISSI trial showing an efficacious effect when one gram or more per day of EPA/DHA was administered to patients with heart failure. After three months, mortality decreased by 41 per cent; after four months sudden death decreased by 53 per cent. Colquhoun concluded that we should move away from the notion of a low fat diet because food is meant to be enjoyed, and not seen as a punishment. And finally, he pointed out that it is

useless to tell people to eat more fish – if you don't eat fish, you won't eat fish – you need supplements.

Merlin Thomas (Baker IDI Diabetic Complication Lab) noted that every second person diagnosed with diabetes is an older person. Diabetes increases the risk of an early death; by the end of 2012 over four million deaths worldwide will be attributable to diabetes. Abdominal fat is the major risk factor and diet with exercise is needed to reduce this risk factor.

Yvonne Coleman (Nutrition Consultants Australia) reported that until recently the interaction between medicines and food has largely been concerned with absorption and reducing side effects. A shift in focus occurred in the 1990s with the discovery that grapefruit juice enhanced drug availability. As the elderly are often high consumers of medicines, she advised that although food-drug interactions are usually negative, some interactions may enhance drug effectiveness and therefore require the patient to take a reduced dose. Coleman noted there are numerous mechanisms where drugs impact on nutritional status, but few known interactions are integrated in clinical practice.

Eric Reynolds (Melbourne Dental School and Oral Health CRC) noted that oral diseases, including dental caries, periodontal disease and mucosal diseases, have become a major public health issue since the population has become older. Nearly one in four

Australian adults have moderate to severe periodontitis and the prevalence of oral cancer is increasing. Strong evidence now links chronic oral diseases with six systemic diseases: diabetes, cardiovascular disease, preterm and low weight births and chronic inflammatory diseases such as arthritis and cancers. The good news is that major oral diseases are preventable with daily oral hygiene; following a nutritious diet, early diagnosis of problems and effective treatment. Fluoride-containing toothpastes and mouthwashes have significantly decreased tooth decay, but flossing is the most important element of dental hygiene.

Andy Sinclair (Deakin University, Melbourne) said that consumption of fish and foods high in antioxidants, exercise, maintaining a healthy weight and continuous learning have been shown to decrease the risk of the dementia. Age, head injury, consumption of a high fat diet, obesity, smoking, cardiovascular related diseases such as hypertension and diabetes and HRT are thought to increase the risk. Sinclair hypothesised that since nutrition is linked with cardiovascular and blood vessel health, it followed there should be an association between nutrition and neural health via neural blood vessels.

Some studies have shown improved memory performance in mild cases of Alzheimer's disease with a nutritional drink rich in omega 3 fatty acids and trials have found that EPA and DHA improved depression scores in elderly people with mild cognitive impairment.

Vicki Flood (University of Wollongong) reported results from a Blue Mountains eye study, where a nutritional supplement including vitamins C and E, beta-carotene and zinc reduced acute macular degeneration (AMD) in 25 per cent of cases with early signs of AMD. Other findings from the study showed a number of dietary factors help reduce the risk of AMD including consumption of fruits and vegetables (particularly leafy green vegetables), oily fish (high in omega-3 fatty acids), foods high in lutein such as enriched eggs, nuts and seeds, lean red meat and oils high in omega-3 fatty acids.

Solomon Yu (Queen Elizabeth Hospital Adelaide) discussed sarcopenia, age-related loss of muscle mass with a corresponding loss of muscle strength in older people. It is associated with an increased risk of physical disability, contributes to frailty, loss of independence, increased falls and a significant increase in healthcare costs.

It is estimated that a 10 per cent decrease in sarcopenia could result in an annual saving of \$1.1 billion. Yu concluded that current research suggests a multifactorial approach in the management and reduction of sarcopenia with exercise and nutritional therapy as key factors.

Caryl Nowson (Deakin University Melbourne) noted that older adults are at a greater risk of injury due to falls; every five to six minutes an Australian is admitted to hospital with an osteoporotic fracture. Contributing factors include low physical activity and body weight, low lean and fat mass, compromised vitamin D status, malnutrition, low calcium and medical conditions such as osteoporosis, dementia, osteoarthritis and stroke. A number of nutritional factors have been found to reduce falls and fractures including vitamin D and calcium supplementation, resistance training, particularly when combined with adequate protein consumption. A daily protein intake of between 1.2-1.5 g/kg of body weight is suggested to alleviate age-related muscle loss. These levels are higher than the current recommended daily intake. ●

Cally Matthews is a PhD candidate at Deakin University, Melbourne.

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NEW RESEARCH AND PRODUCTS

From squash to salt microspheres, new options abound in ingredients.

Words by Lynn Elsey

Sesame and bran oil reduce blood pressure

A new study indicates that eating foods cooked with sesame and rice bran oil works nearly as well as taking medicine to reduce blood pressure and improve cholesterol levels.

The 60-day study tested 300 men and women in New Delhi, India with mild to moderately high blood pressure. One group was treated with a common blood pressure reduction medication (nifedipine), a second group consumed an ounce of a special blend of sesame and rice bran oil in their daily meals. A third group consumed the oil and took medication.

All three groups registered a drop in systolic blood pressure. The group consuming the oil blend had an average 14 point decrease compared to 16 points for those taking the medication. The members of the third group, taking both, had a 36-point drop. The researchers also noted a significant drop in diastolic blood pressure for all three groups.

They also tested for cholesterol and found that those using the oil had a 26 per cent drop in LDL ("bad") cholesterol and a 9.5 per cent increase in HDL ("good") cholesterol. No changes were noted for patients taking the medication but those in the combined group had a 27 per cent drop in LDL and 10.9 per cent increase in HDL.

According to one of the researchers, Devarajan Sankar, a research scientist at Fukuoka University Chikushi Hospital in Chikushino, Japan,

healthier fatty acids and antioxidants in the oil blend – such as sesamin, sesamol, sesamol and oryzanol – may explain the results. He said that antioxidants and oil compounds have been linked to lower blood pressure in earlier studies.

Sankar also said that more research was needed to properly assess the veracity of the results. The oil blend used for the study, Vivo (produced by Adani Wilmar of India) was made specifically for the study and isn't commercially available.

The study was presented at the American Heart Association's High Blood Pressure Research 2012 Scientific Sessions.

Lo salt microspheres

Tate & Lyle have launched a new ingredient that the company claims tastes, labels and functions like salt but allows a 25 to 50 per cent salt reduction in applications.

Soda-Lo salt microspheres was created with a technology that turns standard salt crystals into free-flowing crystalline microspheres. The smaller, low-density crystals maximise surface area relative to volume, which allows them to provide a salty taste with significantly less salt.

Because the crystals are constituted from salt, the new ingredient alleviates issues with bitter aftertaste or poor flavours that have been associated with other salt compounds or substitutes.

As mentioned in an earlier issue of *food australia* (December 2011, page 6)

Tate & Lyle has licensed the ingredient from Eminate, a subsidiary of The University of Nottingham (UK).

"Having a salt reduction alternative that's made from real salt and delivers on that taste expectation could be the first step towards breaking that link in people's minds that a low-salt product is a bland one," according to Andy Hoffman, the director of health and wellness innovation for Tate & Lyle.

The company says that the new ingredient has been shown to function in a wide variety of foods including baked goods, breadings and salty snacks and that it is continuing to assess its suitability for other applications.



Squash and beetroot as stabilising options

Residue from pumpkin and beetroot may offer new stabilising options for emulsion-based foods according to new research.

A team of scientists from Wales and Argentina found that pectin derived from beetroot and butternut squash residue acted as a stabilising agent in food emulsions for more than 30 days, flagging it as a potential option as a food additive.

The research team included scientists from the Centre for Water Soluble Polymers in the UK, the University of Buenos Aires City University and the National Scientific and Technical Research Council of Argentina.

The team said that the pectins were able to stabilise oil in water emulsions over 30 days and also found that the fractions adsorbed at the oil-water interface was rich in protein and/or polyphenols.

The research involved evaluating the physicochemical characteristics and functional properties of butternut and beetroot pectins derived by enzymatic extraction from byproducts of vegetable processing. The researchers applied an isolation process using cellulose at 30°C, avoiding the use of mineral acids and high temperatures.

The results included finding that beetroot pectin gels at different calcium concentrations, making it stable at high temperatures. Beetroot pectin produced a thickening effect in aqueous systems; while both pectins act as emulsifiers and allow the production of stable emulsions.

The results of the study have been published online ahead of publication in *Food Hydrocolloids*, "Butternut and beetroot pectins: Characterization and functional properties".

Pepsi launches fat busting soda

Pepsi has launched a new soda in Japan that claims to reduce fat levels and suppress the appetite.

According to Suntory, Pepsi's distributor in Japan, Pepsi Special contains "indigestible dextrin", e.g., dietary fibre. Suntory claims that the ingredient helps reduce the amount of fat the body absorbs and also helps fight off hunger.

The company has partially based its claim on a paper published in *Nutrition* in April 2006, linking dextrin and the amount of fat absorbed from food in rats.

Although Pepsi Special has been allowed to carry the government approved FOSHU symbol – meaning it is officially deemed to be an ingredient with health functions – global criticism of the launch has been quite energetic. Critiques range from concerns about linking health benefits and soda to questions regarding the research underlying the claims of the product.

Vitamin K

A new ingredient that is claimed to help improve bone health through vitamin K is now available for inclusion in dairy products, drinks, baked and bar products. UniK2, which was developed by Swiss-based Frutarom Health, is GRAS certified and supported by the European Food Safety Authority approval for bone health as a contributor to the maintenance of normal bones.

UniK2 is a natural source of vitamin K2 in the form of menaquinone-7 (MK-7). According to the company, MK-7 provides a longer lasting efficacy profile than other forms of vitamin K.

The new ingredient is said to improve the binding of calcium and the collagen status in bones by activating a protein called osteocalcin, which results in an effective method of improving bone quality and strength, helping



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prevent osteoporosis (A study recently published in Proceedings of the National Academy of Sciences provides further evidence that osteocalcin may play a significant role in helping bones resist fracture, ref: doi:10.1073/pnas.1201513109).

The ingredient is derived from Japanese *Bacillus natto*, a rich natural source of vitamin K2, traditionally produced by fermentation of soybeans wrapped in rice leaves.

UniK2 is heat stable, comes in powder or oil form and is suitable for dietary supplements and functional foods including beverages, nutrition bars and dairy and bakery products. The bone-health properties make it especially relevant for products that target women and the elderly.

According to the company, research indicates the ingredient may also offer additional benefits, including support for skin and brain health.

Frutarom is currently developing functional food products with the powdered blends for drinks, functional milk and nutritional bars.



A tomato twist

Across the Atlantic, two new tomato juice products with another EC health-certified ingredient, Fruitflow, are being promoted as offering cardiovascular benefits.

Langer's Tomato Juice Plus and L&A Tomato Juice both contain Fruitflow, one of the first ingredients to receive an Article 13.5 health claim from the European Food Safety Authority. This allows the producer to state that Fruitflow "helps maintain normal platelet aggregation, which contributes to healthy blood flow".

The ingredient, a natural tomato-based concentrate made from Mediterranean tomatoes, has shown in clinical research to help maintain healthy blood flows by supporting blood platelet function by inhibiting platelet aggregation, a known cause of heart attack, stroke and venous thrombosis.

Fruitflow was discovered by Asim Dutta Roy at the Rowett Institute (University of Aberdeen) in 1999. The technology formed the basis of a company called Proxavis, which owns the rights to the ingredient. According to DSM, which won commercialisation rights in 2010, the positive attributes of Fruitflow take effect within one and a half hours of consumption and continue to enhance blood circulation for up to 12 hours.

The ingredient has been GRAS certified for use in yogurt drinks, fruit juices and fruit-flavoured drinks.

The new juices are made from 100 per cent pure tomatoes without any added sugar, high fructose corn syrup, sweeteners or preservatives. Along with Fruitflow, they are also enhanced with other vitamins and minerals.

Langer plans on a nationwide launch of the two products in 2013. 

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ONE HUMP OR TWO?

Camel milk has played an important role in the diet of nomadic and pastoral cultures for centuries. Because it is highly transportable, convenient and a low-energy source of sustenance – nomads can live for up to a month on nothing but camel milk – it is an ideal alternative to cow’s milk in the arid regions of the world.

Along with its practical assets, camel milk has been identified as having significant health benefits including being high in iron, having three times the vitamin C as cow’s milk, rich in B vitamins, high in protein and low in fat and cholesterol. It also may be suitable for those who are lactose intolerant.

The Food and Agriculture Organization of the UN (FAO) is a big fan. The organisation has found that “there is a growing recognition of the value and benefits of camels for their milk, meat and fibres”.

However, because camel milk has a different protein composition to cow milk, attempts to make cheese from it haven’t been successful.

“Camel milk is very difficult to coagulate because of its low levels of k-casein, the protein that makes the milk coagulate,” said Rolando Saltini, a Chr Hansen product manager. Use of bovine, microbial or vegetable coagulants result in either weak curd formation or a complete absence of clotting.

However, the company has developed a new ingredient that could have far-reaching impact on the nomadic community.

Far-M is pure camel chymosin produced by fermentation. Designed for both cow and camel milk processing, it allows production of firmer camel cheese. Also, production yields are comparable to those from cow’s milk cheese. It comes in a liquid and highly stable powder, making it suitable for transporting at ambient temperatures and to rural areas.


“Since we are the only company producing camel chymosin by fermentation – the only coagulant that allows production of camel cheese – we feel that we have the obligation to support the development of this industry,” Saltini said.

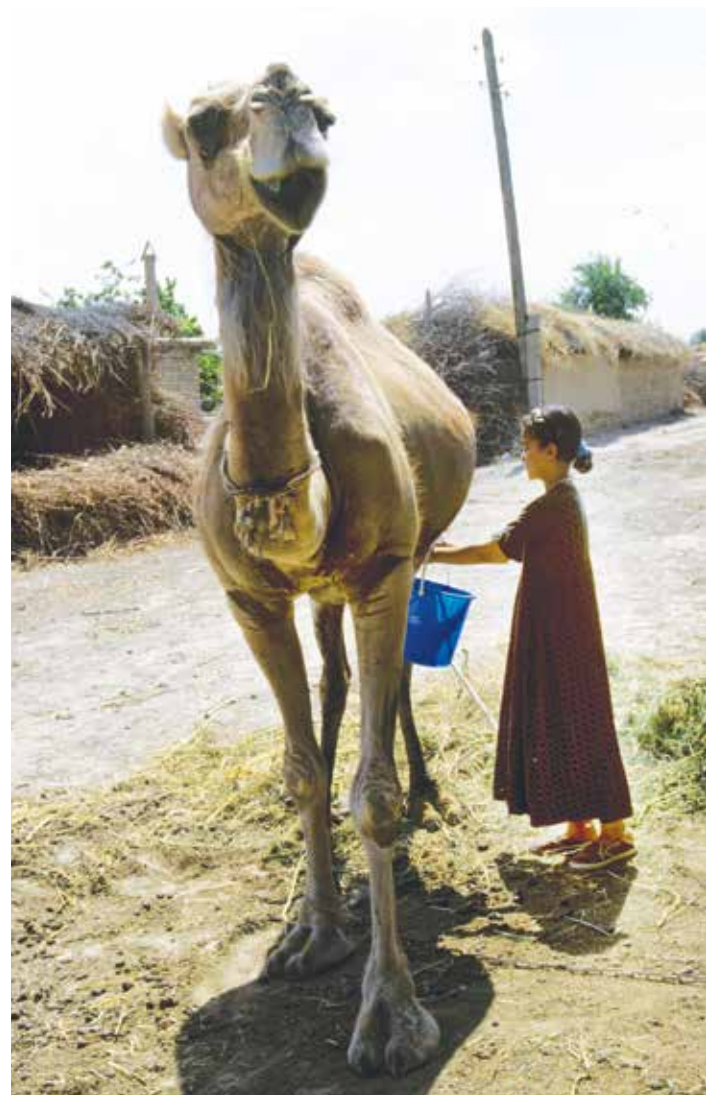
As a result, Chr Hansen has teamed up with a Kenyan company, Oleleshwa Enterprises, to improve the conditions of small-scale camel owners in Kenya and Somalia. By developing basic knowledge about camel cheese production, the project aims to enable camel owners to produce camel cheese for sale as well as their own consumption.

The project also involves developing rural and industrial camel cheese recipes which will be provided to the African and Middle Eastern camel community free of charge, evaluating the taste of the cheese and developing production manuals.

Initial results have been positive.

Anne Bruntse, the director of Oleleshwa Enterprises, has reported that trial samples had resulted in cheese that tasted better, had a better consistency and made the cheese-making process easier.

“If successful, this project could potentially improve the livelihood of thousands of rural inhabitants in Northern and Eastern Africa,” said Henriette Oellgaard, CSR Manager, Chr Hansen. She said that the project might also lead the way for future commercialisation of Far-M. 





AUSTRALIAN & NEW ZEALAND 2013

February 18 and 23. FoodLegal Intensive Workshop: Navigating the Health Claims Standard. The Menzies Hotel, Sydney (18 Feb), Law Institute of Victoria (22 Feb). Visit www.foodlegal.com.au for more details.

February 19-20. New Zealand and Australia Sensory and Science Symposium. Lower Hutt, Wellington, NZ. A workshop aimed at sensory and consumer professionals. Contact Rebecca Shingleton at rebecca.shingleton@fonterra.com for more information.

February 26-27. Australian Dairy Conference, Dairy Innovators' Forum, Twin Waters Resort, Sunshine Coast, QLD. Visit www.australiandairyconference.com.au for more details.

March 1-17. Melbourne Food and Wine Festival. Melbourne. Visit www.melbournefoodandwine.com.au for more information.

March 5-6. ABARES Outlook 2013 conference. National Convention Centre, Canberra. The annual forum will have a theme of "future food, future farming", with a focus on food security and supply, food production and consumption. Visit www.daff.gov.au for more information.

Mar 19. Carbohydrate intakes – high, low or irrelevant? A symposium presented by ILSI SEAR Australasia and the Grains and Legumes Nutrition Council. Contact ILSI SEAR, admin@ilsi.org.au for more details.

April 3-4. AIFST Food Microbiology Rapid Methods Update Wet Workshop and Seminar. Deakin University, Burwood Campus. Visit www.aifst.com.au for more information.

April 14-16. Fine Food WA. Perth Convention and Exhibition Centre. Visit www.finefoodwesternaustralia.com.au for more information.

May 14-15. ConTech 2013 Group Confectionery and Food Sector Technical Conference. Hilton on the Park, Melbourne. Visit www.aigroup.com.au for more details.

May 23-25. AUSVEG 2012 National Convention. Adelaide Convention Centre. The annual convention, trade show and awards for excellence event. Visit www.ausveg.com.au for more information.

May 24-26. The Food Show Wellington. Westpac Stadium, Wellington, NZ. Visit www.foodshow.co.nz for more details.

June 24-25. Lunch! Sydney. Royal Hall of Industries, Moore Park. Industry event for the food-to-go market. Visit www.lunchshow.com.au for more details.

July 14-16. The 46th Annual AIFST Convention. Brisbane Convention and Exhibition Centre. Visit www.aifst.asn.au/convention for more information.

August 12-13. Lunch! Melbourne. Melbourne Convention and Exhibition Centre. Industry event for the food-to-go market. Visit www.lunchshow.com.au for more information.

September 9-12. Fine Food Australia. Sydney Convention and Exhibition Centre, Sydney, NSW. Visit www.finefoodaustralia.com.au for details.

INTERNATIONAL 2013

March 4-5. Healthy Aging in Asia. Strategies to Meet Health and Lifestyle Challenges. Grand Copthorne Waterfront, Singapore. The conference will include current scientific findings on diet, nutrition and longevity and discuss strategies for more effective nutrition and health. Sponsored by ILSI Southeast Asia Region. Visit www.ilsi-healthyaging2013.com for more details.

March 6-8. Global Food Safety Conference 2012. Barcelona, Spain. Visit www.mygfsi.com for details.

March 20-22. Food Vision 2013. Cannes, France. An industry summit to provide an open forum for the discussion of strategic issues and challenges related to the evolution, development and marketing of innovative food, drink and nutrition products. Visit www.foodvisionevent.com for more information.

April 28-30. Food Hydrocolloid Conference 2013. Charleston, South Carolina, US. Theme: Sustainability, Functionality and Awareness". Visit hydrocolloid.com/conferences/conferen.asp for more details.

May 7-9. Fi Istanbul 2013. Istanbul Convention & Exhibition Centre, Turkey. A new event for food and beverage companies from Turkey and other countries in South East Europe, the Middle East and North Africa. Visit www.ingredientsnetwork.com for more information.

May 15-17. 2nd International Pharma-Nutrition, Singapore. Visit www.pharma-nutrition.com for details.

May 15-17. International Association of Food Protection European Symposium on Food Safety. Marseilles, France. Visit www.foodprotection.org for details.

May 24-26. FoodAgro Africa 2013. Dar-Es-Salaam, Tanzania. The 17th annual trade exhibition includes exhibitors from more than 30 countries. Visit www.foodagroafrica.com for more details.


July 8-9. International Conference on Food Processing and Technology. London, UK. Visit www.waset.org for more information.

July 13-16. The US Institute of Food Technologists Annual Meeting, Chicago, US. Visit www.ift.org for more details.

September 9-11. 13th ASEAN Food Conference. Singapore. Visit www.sifst.orgsg for more details.

September 11-13. Food Ingredients Asia. Bangkok, Thailand. Visit www.ingredientsnetwork.com for more details.

September 16-20. drinktec 2013. New Munich Trade Fair Centre. Munich, Germany. Web: www.drinktec.com.

October 5-9. Anuga. Cologne, Germany. "Taste the Future". Visit www.anuga.com for more information. 

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CP Kelco is the perfect partner for the yoghurt producer. Whether it's developing a thick, indulgent mouthfeel or a refreshing, light, creamy texture, CP Kelco has the in-depth application experience to help yoghurt manufacturers with product design. After a multiyear sensory study with an expert sensory panel, CP Kelco has developed a Yoghurt Predictability Tool to help customers "dial in" texture in cup set or spoonable yoghurts. Identify the needed attributes and let our tool design the texture to match!

With world-class application knowledge and an extensive portfolio of ingredients, customers can produce high quality stirred and cup-set yoghurts with a variety of texture profiles that are stable during transport and for the shelf-life of the product.

GENU® Pectin | KELTROL® Xanthan Gum | KELCOGEL® Gellan Gum
CEKOL® Cellulose Gum | GENU® Carrageenan



Keep fruit & vegetables fresher for longer...

Ethylene Management System for Household and Commercial Applications

Ethylene is a naturally generated growth regulator which promotes the aging and ripening of fruit, vegetables and flowers.

- Slow down the ripening process and extend your shelf-life for weeks
- Reduce waste, decay, discoloration, wilting, softening and shrinkage
- Insurance against poor arrivals and shipping adjustments
- Environmentally safe and non-toxic
- Scientifically tested



**commercial enquiries*



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