



FOOD - The Final Frontier

47th Annual AIFST Convention

PROGRAM & ABSTRACTS

MELBOURNE CONVENTION
AND EXHIBITION CENTRE

22-25 JUNE 2014

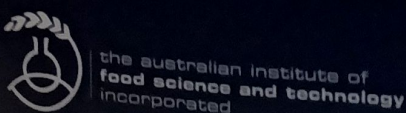
Challenges and opportunities
in the 21st Century



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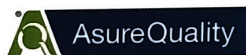
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WELCOME

On behalf of the Victorian Branch and the Council of the AIFST, we would like to welcome you to the 47th Annual AIFST Convention.

The Annual AIFST Convention is always a great opportunity for professionals from all sectors of the Australasian food and allied industries to network with colleagues and friends, and to learn about and share experiences in the latest developments in the profession. The Convention will be an informative, educational and enjoyable event, and if that isn't enticing enough, we have outstanding local and international speakers throughout the convention program who will share with you some of the latest innovations and developments in food science and technology. This year's Convention theme is "Food – The Final Frontier: Challenges and Opportunities in the 21st Century".

Befitting this theme, the Convention program includes such "hot topics" as:

- Processing efficiency and effectiveness;
- Diet, health and performance – what are the choices;
- Food reformulation to meet the demands of the 21st century consumer;
- Traceability – how, when and why;
- Allergen risk management and developments;
- Food chemistry matters;
- Food safety – contaminants, pathogens and regulations;
- Supply chain economics – the bottom line;
- Cereal science – issues for the food industry;
- Sustainability; and
- Agri-food sector innovations.

The 2014 Convention includes a half-day devoted to our young and developing scientists – so please make sure that you come along and support our talented leaders of tomorrow! We also have a number of workshops scheduled for Wednesday 25th June as part of the program, all accredited within the AIFST Continuing Professional Development (CPD) initiative.

One of our greatest Winter Olympians and a Melbourne native – Alisa Camplin-Warner – 'kicks off' the Convention with a motivational 'adrenaline buzz' addressing skills, tips and tools to use in your life, team and workforce. There are great messages in her address! A highlight of the Convention this year is our "Food Leaders Roundtable Forum" during which the topic "From Mining Boom to Food Boom – A Reality?" will be debated. Emma Alberici from ABC television will moderate the discussion and Q&A from the audience. A lively session is guaranteed! The 2014



Convention is co-located with "foodpro 2014", the first time it has been held in Melbourne. Therefore, as a complement to the AIFST program you will also have the opportunity to see the latest offerings from suppliers to our industry.

Whether you're a professional or student, member or non-member, marketer or scientist, working on-farm or in food processing and distribution, food safety or quality control, training or retailing, we have something to offer you all at this years' Convention.

On behalf of the Organising and Technical Committee, we look forward to welcoming you all to the Convention.

Anne Astin – AIFST President,
Joe Cardamone – Convention Chair,
Geoffrey Smithers – Convention Deputy Chair & Technical Committee Lead

Convention Committee

Joe Cardamone – Convention Chair
Geoff Smithers – Deputy Chair
Deon Mahoney
Stuart Smith
Jenny Robertson
Peter Bush
David Topping
Tom Lewis
Bronwyn Graham
Mel Malloch

Disclaimer

Details are correct at time of printing. In the event of unforeseen circumstances, the organiser reserves the right to delete or alter items in the conference program.

COLLABORATING WITH OUR PARTNERS



GENERAL INFORMATION

Registration and Information Desk

The Registration desk will be located in the Clarendon Auditorium Foyer, Level 2. For information, assistance or messages, please contact the Registration Desk.

Registration Desk Operating Hours

Sunday	1200 – 1830
Monday & Tuesday	0730 – 1800

Workshop Registration

Wednesday	0800 – 1600
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Please note that any financial adjustments need to be made to your account, credit card facilities will be available. Any refunds required will be sent from the AIFST National Office after the Convention. American Express, Diners, Visa, and Mastercard are accepted.

Name Badges

Name Badges must be worn at all times. Your name badge is your "entry ticket" to technical sessions.

Morning, Afternoon Teas & Lunches

Morning & afternoon teas and lunches will be served in the Clarendon Auditorium Foyer, Level 2.

Speakers Preparation Room

If you are making a presentation at the Convention you are invited to check in at the Speaker Support Centre, (Clarendon Room F, on Level 2), at least 1 hour prior to presentation. Speakers will be able to run through their presentations with technical support staff. Please check which room you will be speaking in.

AIFST Annual General Meeting (AGM)

AIFST Annual General Meeting (AGM) will commence at 7.00am on Tuesday 24th June 2014 in Clarendon Room on Level 5. Bookings are required for catering purposes, please see registration desk.

Welcome Reception

The Welcome Reception will be held on Sunday evening 22nd June and is being held in the Clarendon Auditorium Foyer Level 2. This evening is proudly sponsored by Steggles.

Cheese & Wine Evening

The cheese & wine evening will be held on Monday evening 23rd June and is being held at Showtime Events Centre, South Wharf Promenade. This evening is proudly sponsored by Hawkins Watts. **Tickets must be presented to gain entry into the cheese & wine evening.**

Please note that unless you have purchased a ticket, a day delegate registrations does not include the cheese & wine function.

Convention Dinner

The Convention Dinner will be held on Tuesday evening 24th June, to close the Convention. The Dinner will be held Melbourne Room 1, Level 2 of the Convention Centre and is proudly sponsored by The Manildra Group & Rentokil. Pre dinner drinks will be served from

1900 in the foyer. **Dress** – the theme for the night is "star trek", where you can 'reach for the stars' and you are encouraged (if you are game) to come dressed for the star trek theme, prizes will be awarded for the best dressed. **Tickets must be presented to gain entry into the Dinner.**

Business Services

Delegates are advised that the Business Centre of the Convention Centre is located in the Main Foyer at the Information Desk and will be operational during Exhibition hours. The Business Centre offers a range of services and consumer items.

Free Wi-Fi

- Coverage extends throughout the venue, including meeting rooms, exhibition bays, the plenary and all other public spaces.
- Suitable for webmail, Facebook, Twitter and basic internet browsing (but not for streaming video such as Skype).
- Maximum bandwidth of 256Kb/s per user, with actual bandwidth influenced by the number and density of concurrent users.
- Requires users to subscribe (free of charge) via a login page and agree to a set of terms and conditions.

Parking

The Melbourne Convention and Exhibition Centre has an underground car park, enter via Normanby Road – 1,066 cars. Other parking is available at Corner of Montague and Munro Streets, enter via Munro Street – 350 cars. Freeway car park, enter via Munro Street – 650 cars. South Wharf Retail car park, enter via Normanby Road – 800 cars. Siddeley Street car park, enter via Siddeley Street – 690 cars.

Transport

Taxis are available outside the Convention Centre, in Convention Centre Place or Clarendon Street entry.

Room Allocations

The Plenary sessions will be held in the Clarendon Auditorium. Concurrent sessions will be held in Clarendon Rooms D/E on level 2, and Clarendon Rooms A & B on level 5, workshops will be held in Clarendon Rooms C, D & E on level 2.

Abstracts and Posters

In this booklet is a summary of the Convention abstracts that relate to the sessions and posters being presented as part of this year's technical program. Delegates are encouraged to view the posters located in 'Inkwell Foyer' Ground floor of the Exhibition Centre, at their leisure and the authors have been requested to be at their poster during morning and afternoon tea and the last half hour during lunch each day.

The abstracts will assist delegates in selecting, which sessions they would like to go to.

FoodPro

Delegates have an entry to Foodpro from the "Inkwell Foyer" on the ground floor. Name badges will be scanned to gain entry. AIFST has a stand, **D20** so do come and visit us!!

PROGRAM OVERVIEW – FOOD – THE FINAL FRONTIER

JUNE

Sun 22nd

1200 – 1800 REGISTRATION OF DELEGATES			
PLENARY SESSION 1 CHAIR JO DAVEY		Room	Abstract No.
1300 – 1500	Young Scientists Presentations and Career Planning Workshop <i>Comparison of spray and freeze dried tuna microcapsules protected with whey protein isolate-gum Arabic complex coacervates</i> Divya Eratte, Federation University, Mount Helen, VIC	Clarendon Auditorium	YSRP1
	Can canola meal be used to treat cancer? Saira Hussain, Charles Sturt University, Wagga Wagga, NSW		YSRP2
	Determination of folates in vegetables and their retention during boiling Prayna Maharaj, University of South Pacific, Suva, Fiji		YSRP3
	Effects of Quinoa Seeds (<i>Chenopodium quinoa</i>) on the body composition, plasma profile and adipose tissue gene expression in C57BL/6 mice fed a high fat diet Diana Navarro – Perez, La Trobe University, Melbourne, VIC		YSRP4
	Effects of carob powder substitution on physico-chemical properties and storage stability of muffins Bonny Rawson, Curtin University, Perth, WA		YSRP5
	Chemical composition of strawberry cultivars grown in open-field and under UV-opaque film in Western Australia Isabelle E Sam-Soon, Curtin University, Perth, WA		YSRP6
	Antioxidative and Antihypertensive activity of Fijian noni (<i>Morinda citrifolia</i> L.) juice Komal Shandil, University of South Pacific, Suva, Fiji		YSRP7
1500 – 1530 AFTERNOON TEA PROUDLY SPONSORED BY AMYL MEDIA			
1530 – 1700	Malcolm Bird Award Presentations Chair Lara Wakeling <i>Waxy durum flour as an anti-staling agent in baked goods</i> Laura Blake, Adelaide University, Adelaide, SA	Clarendon Auditorium	
	Enzyme-substrate complex; maintaining enzyme structure and activity Anton Pluschke, University of Queensland, St Lucia, QLD		
1600 – 1615	Student Product Development Award Chair Lara Wakeling <i>Lacteo's Lemon Myrtle ice cream</i> Bonny Rawson, Isabelle Sam-Soon, Curtin University, Perth, WA		SPD1
1615 – 1630	WakePops – convenient pancake breakfast Jeffrey Sutanto; Glendon Woodward; Vincent Wong, University of NSW, Sydney, NSW Presentation of Bruce Chandler Book Prize & AIFST President's Award		SPD2
1700 – 1800	Plenary Session <i>Skills, tips and tools you can use in your life, team and workforce</i> Alisa Camplin-Warner OAM		
1800 – 1930	Welcome Reception with Delegates and Exhibitors Proudly sponsored by Steggles		

Mon 23rd

0730 – 1800 REGISTRATION OF DELEGATES			
PLENARY SESSION CHAIR ANNE ASTIN		Room	Abstract No.
0830 – 0915	Welcome to delegates & official opening Victorian State Government representative Jason Hincks CEO FoodBank	Clarendon Auditorium	
	AIFST Food Industry Innovation Award		
0915 – 0945	Keith Farrer Award of Merit Citation and Address <i>Improved microbial food safety assurance: tools and technologies to reduce the 'guesswork'</i> Tom Ross, University of Tasmania, Hobart, TAS		
0945 – 1015	J R Vickery Address Cheese – advances and challenges in studying a fermented food Don McMahon, Utah State University, Logan, USA		A1
1015 – 1030	IFT Certified Food Scientists (CFS) certification program Bronwyn Graham, AIFST		
1030 – 1100	MORNING TEA PROUDLY SPONSORED BY GIVAUDAN		
1100 – 1240	SESSION 1 – CONCURRENT 1 CHAIR BOON LIANG KOH	Clarendon Rooms D&E	
	Processing efficiency and effectiveness – The bottom line!		
1100 – 1125	Delivering sustainable process improvement in food manufacturing Steve Roger, Lauras International, Melbourne, VIC		A2
1125 – 1150	Increasing the energy efficiency of baking process through advanced control systems Weibiao Zhou, National University of Singapore, Singapore		A3
1150 – 1215	Energy efficiency – it's all about leadership Graham Bryant, Simplot Australia, Mentone, VIC		A4
1215 – 1240	Reclaiming healthy, sustainable products from soy protein waste streams Charles Schasteen, DuPont Nutrition & Health, St Louis, USA		A5
1100 – 1240	SESSION 1 – CONCURRENT 2 CHAIR MALCOLM RILEY	Clarendon Auditorium	
	Diet, health and performance – what are the choices? Organised in partnership with Nutrition Society of Australia		
1100 – 1125	Global burden of disease Lynne Cobiac, SAHMRI, Adelaide, SA		A6
1125 – 1150	Overnutrition Tim Gill, University of Sydney, Sydney, NSW		A7
1150 – 1215	Understanding dietary patterns and health Sarah McNaughton, Deakin University, Burwood, VIC		A8
1215 – 1240	The causes of obesity and associated weight control techniques: the views of consumers from five countries Tony Worsley, Deakin University, Burwood, VIC		A9

Mon 23rd

CONTINUED

1100 – 1240	SESSION 1 – CONCURRENT 3 CHAIR ALLISON VELLA	Clarendon Room A	
	<i>Food Safety Regulations – Their impact on how we act and respond</i>		
1100 – 1125	<i>International perspective</i> Simon Brooke-Taylor, Brooke-Taylor & Co, Milawa, VIC		A10
1125 – 1150	<i>Food contaminants old and new – a national perspective</i> Marion Healy, FSANZ, Canberra, ACT		A11
1150 – 1215	<i>Food Safety in Victoria – how safe is my lunch?</i> Heather Haines, Department of Health, Melbourne, VIC		A12
1215 – 1240	<i>Impact of regulation in the Food Standards Code (FSC) on innovation</i> Carol Bate, Fonterra Co-operative Group, Mount Waverley, VIC		A13
1100 – 1240	SESSION 1 – CONCURRENT 4 CHAIR MARY WHELAN	Clarendon Room B	
	<i>Let's eat! – implications of feeding large numbers in various locations</i> Organised in partnership with the National Cook Chill Group		
1100 – 1125			
1125 – 1150	<i>Transport and food rescue – the logistics behind procuring, cooking and distributing rescued food</i> Kellie Watson, FareShare, Abbotsford, VIC		A14
1150 – 1215	<i>Microbiological challenges in cooked chilled food</i> Rob Chandler, DTS Food Laboratories, Kensington, VIC		A15
1215 – 1240	<i>The child with a food allergy challenges our food service system. How Monash Health overcame the challenge by producing Allergen Free Meals</i> Imran Hanif, Monash Health Central, Cheltenham, VIC		A16
1240 – 1400	LUNCH PROUDLY SPONSORED BY TATE & LYLE		
1400 – 1540	SESSION 2 – CONCURRENT 1 CHAIR LEIF LUNDIN	Clarendon Rooms D&E	
	<i>Food reformulation for the 21st century</i>		
1400 – 1425	<i>Food structuring approaches and opportunities for healthier manufactured foods</i> Li Day, CSIRO Animal Food and Health Sciences, Werribee, VIC		A17
✓ 1425 – 1450	<i>New possibilities thanks to Roquette's innovative and renewable MICROALGAE</i> Dior Sawaya, Roquette Freres, France		A18
1450 – 1515	<i>Addressing Australia's health concerns with fibre and protein in food formulations backed by human clinical studies</i> Anders Henriksson – DuPont Nutrition & Health, Banksmedow, NSW		A19
1515 – 1540	<i>The challenges of translating nutrition science and trends into real foods</i> John Pitcher, Cereal Partners Worldwide, Rutherglen, VIC		A20

JUNE

Tues 24th

0730 – 0820	REGISTRATION OF DELEGATES	Clarendon Foyer	
0730– 0845	AIFST ANNUAL GENERAL MEETING (AGM)	Clarendon Room (level 5)	
0900 – 1050	PLENARY CHAIR ANNE ASTIN		
0900 – 0930	From mining boom to food boom – a reality? Rob McConnel, Deloitte	Clarendon Auditorium	A45
0930 – 1050	Following Mr McConnel's presentation, a Roundtable discussion featuring the following industry leaders will debate the topic. CEO Roundtable discussion. Moderator Emma Alberici Callum Elder, Simplot Australia Michele Allen, Chair Meat & Live Stock Australia Maurice Moloney, Group Executive-Agribusiness, CSIRO Shirley Harlock, Chair of 'FutureDairy' research project, Chair Dairyfood Safety Victoria Peter Schutz, Chair, Food Innovation Australia Rob McConnel, National Industry Leader, Agribusiness, Deloitte		
1050 – 1120	MORNING TEA PROUDLY SPONSORED BY DAIRY FOOD SAFETY VICTORIA		
1120 – 1300	SESSION 1 – CONCURRENT 1 CHAIR GEOFFREY ANNISON	Clarendon Auditorium	
	Delivering the goods – Supply chain economics		
1120 – 1145	Chilled meals – national supply economics Callum Elder – Simplot Australia, Mentone, VIC		A46
1145 – 1210	Logistics for the design of the whey value chain Pablo Juliano, CSIRO Animal, Food and Health Sciences, Werribee, VIC		A47
1210 – 1235	Optimal location of spelling yards for the northern Australian beef supply chain Rodolfo García-Flores, CSIRO Computational Informatics, Clayton, VIC		A48
1235 – 1300	Application of probabilistic software tools to assess Campylobacter concerns in tray-packed chicken Tony Pavic, Birling Avian Laboratories, Bringelly, NSW		A49
1120 – 1300	SESSION 1 – CONCURRENT 2 CHAIR PHILLIP LEE WING	Clarendon Rooms D&E	
	Agrifood sector innovation – Latest developments		
1120 – 1145	Meat hub Christine Pitt, Meat & Livestock Australia, North Sydney, NSW		A50
1145 – 1210	Health and nutrition – driving grains innovation Georgie Aley, Grains & Legumes Nutrition Council, North Ryde, NSW		A51
1210 – 1235	Crafting the wines consumers want Kate Harvey, Grape & Wine Research and Development Corporation		A52

Tues 24th

CONTINUED

1630 – 1745	SESSION 3 – CONCURRENT 2 CHAIR STUART SMITH	Clarendon Rooms D&E	
	<i>Food Sustainability in the 21st Century</i>		
1630 – 1655	Both conventional breeding and GM technologies are essential for ensuring a secure food future Matt Gilliham, Food and Wine, Waite Research Institute, University of Adelaide, Adelaide, SA		A78
1655 – 1720	Overcoming the challenges and leveraging the opportunities through collaborative models Nicola Watts, East Gippsland Food Cluster, Bairnsdale, VIC		A79
1720 – 1745	Zero waste dairy plants in Australia Jayani Chandrapala, Victoria University, Melbourne, VIC		A80
1630 – 1745	SESSION 3 – CONCURRENT 3 CHAIR TRISH DESMARCHELIER	Clarendon Room B	
1630 – 1655	The impact of PSA on the New Zealand kiwifruit Industry – at the coalface... David Tanner, Zespri International Ltd, Mt Maunganui, New Zealand		A81
1655 – 1720	Histamine producing bacteria in dried fish products Gary Dykes, Monash University, Clayton, VIC		A82
1720 – 1745	Emerging bugs – new hazards, old hazards, better knowledge, food trends or the people factor? Cathy Moir, CSIRO Animal, Food and Health Sciences, North Ryde, NSW		A83
1630 – 1745	SESSION 3 – CONCURRENT 4 WORKSHOP 1- GOOD MANUFACTURING PRACTICE (GMP) 101 (CONT) FACILITATOR TAMMY MITANI	Clarendon Room B	
1900 – 2300	CONVENTION DINNER PROUDLY SPONSORED BY MANILDRA GROUP & RENTOKIL		

POST CONVENTION WORKSHOP

Wed 25th

0800 – 1200	Registration of Delegates	Clarendon Foyer	
0830 – 1030	Workshop 2 Health claims and scientific substantiation	Clarendon Rooms E	WS2
0830 – 1030	Workshop 3 Mastering the PIF AFGC product information form	Clarendon Rooms F	WS3
0830 – 1030	Workshop 4 Detection of foreign objects in foods	Clarendon Rooms D	WS4
1030 – 1100	MORNING TEA		
1100 – 1300	Workshop 2 Health claims and scientific substantiation (cont)	Clarendon Rooms E	
1100 – 1300	Workshop 3 Mastering the PIF AFGC product information form (cont)	Clarendon Rooms F	
1100 – 1300	Workshop 4 Detection of foreign objects in foods (cont)	Clarendon Rooms D	

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Characterising the quality of blended wheat flour from domestics and imported wheat grains

P1

CHOI*, I., KANG, C-S., KIM, K-H., CHEONG, Y-K., LEE, C-K. & PARK, K-G.

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A wheat cultivar, Keumkang (KK), was developed mainly for noodle making, but the cultivar also showed higher bread-making properties. To observe the ability of substituting KK for hard red spring (HRS), which is imported from abroad, for bread-making, blended wheat flour (BWF) was made with 4, 8, 12, 16 and 20% KK cultivar, and the flour quality of BWF was evaluated. Protein contents were 13.7% for HRS and 11.9% for KK, and the BWF showed protein ranges of 13.3–13.6%. SDS sedimentation indicated no significant difference among HRS, KK, and BWF with 16 and 20% KK. The wet and dry gluten contents were higher in HRS (34.5 and 11.9%) compared to KK (28.6 and 9.9%), respectively. The gluten index of KK (94.6%) was higher than HRS (91.0%), indicating that KK cultivar has higher gluten strength compared to HRS. Water binding to wet gluten was higher in HRS and BWF. Particle size increased in the BWF due to the HRS having a larger particle size. Maximum viscosity of the KK cultivar was slightly lower than HRS and BWF, but this was not significant statistically. Breakdown and setback viscosity also varied between cultivars and BWF, which could contribute to pan-bread quality. The results can be used to determine the optimal blending levels of KK to HRS to make bread with higher end-use quality.

Effects of wheat grain blending for end-use quality improvement

P2

CHOI*, I., KIM, H-S., KIM, Y-J., CHEONG, Y-K., LEE, C-K. & PARK, K-G.

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A wheat cultivar of Keumkang (KK) developed for noodle-making is also used for pan-bread production, as the cultivar also presented higher bread-making properties. The KK wheat was blended with hard red spring (HRS), which is imported from abroad, at 4, 8, 12, 16 and 20% levels. The blended wheat flour (BWF) was formulated for bread dough (100 g method) and investigated for bread-making quality. Strong wheat flour was used as the control bread for comparison. The bread loaf volume (mL) was higher in HRS (900) and strong wheat flour (875) than KK (837), but no significant difference statistically ($P < 0.1$). The BWF showed improved bread volume (ranging from 862–900 mL) compared to bread made with KK only, which was comparable to HRS and wheat flour. Bread crumb firmness (N) results indicated that the KK bread showed the highest firmness followed by wheat flour and HRS. The firmness of BWF bread presented between 2.2 to 2.5, which is similar to strong wheat flour. From the results, the use of KK cultivar for blending with imported wheat grain is a possibility. The colour of the bread crumb was measured to be more green and yellow for all bread samples. Blending of 20% of KK cultivar to imported wheat grain for bread production could be applied in scale-up formulations without affecting the appearance and texture properties.

Production of Pink Ling (*Genypterus blacodes*) head hydrolysate using acid fungal protease

P19

NURDIANI¹, R., VASILJEVIC¹, T., SINGH², T.K. & DONKOR¹, O.N.

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Research on the utilisation of Pink Ling as source of protein hydrolysate and on its functional properties is very limited. The objective of this research was to evaluate the ability of Acid Fungal Protease (AFP) to hydrolyse Pink Ling head. Hydrolysis of Pink Ling head samples was performed in a shaking water bath for 6 hours. Appreciable proteolytic activity of AFP was detected after the first 30 minutes followed by a decrease in the rate of degree of proteolysis. The chromatograms of hydrolysate after hydrolysis showed significantly higher levels of liberated peptides compared with that prior to hydrolysis. It was revealed that the hydrolysates contained hydrophilic peptides, which eluted within the first 20 minutes of RP-HPLC separation.

Preservation of essential fatty acids encapsulated in high-solid matrices with glassy consistency

P21

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Essential fatty acids are compounds of significance in industrial processing, and recent molecular studies are mainly interested in the prevention of their oxidation during preparation and storage of foods. This research follows the 'food materials approach', which aims to characterise the capacity of a high-solid matrix at the vicinity of its glass transition temperature (T_g) to control chemical, biological and enzymatic processes. Understanding the patterns of lipid diffusion will draw a clear picture of the molecular mobility of fatty acids, with further expectations for building a foundation to controlling chemical reactions (e.g. oxidation) in high-solid preparations. Condensed matrices comprising 3% (w/w) high-methoxy pectin with 81% (w/w) co-solute (glucose syrup) and 1% (w/w) oleic acid in triglyceride form were chosen as model systems in this investigation. Work utilised rheological measurements, differential scanning calorimetry, ESEM, FTIR and WAX diffraction to identify the molecular properties of the matrix. Diffusion kinetics of the fatty acid (monitored via UV-visible spectroscopy) were combined with the concept of free volume to identify the mobility of the fatty acids in relation to time and temperature of industrial relevance. Results showed that the amorphous matrix underwent vitrification at -15°C , calculated using the Williams, Landel and Ferry and modified Arrhenius equations. The increment of oleic acid mobility appeared to respond to the matrix's T_g value, and the newly introduced concept of spectroscopic shift factor demonstrated that the triglyceride maintains distinct diffusional kinetics from the structural relaxation of the matrix as a function of time or temperature of observation.

Diffusion kinetics of ascorbic acid in high-solid polysaccharide matrix undergoing glass transition phenomena

P20

PANYOYAI*, N., SMALL, D.M., BANNIKOVA, A. & KASAPIS, S.

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High-solid biomaterials have wide applications in food and pharmaceutical industries. Understanding the non-crystalline character of high-solid systems requires knowledge of their glass transition temperature (T_g) and glassy state. In the latter, molecules are frozen in very high viscosity liquids that restrict molecular mobility. An investigation of the diffusion kinetics of 2% (w/w) ascorbic acid embedded in the glassy polysaccharide matrix of 2% (w/w) high-methoxy pectin plus 76% (w/w) polydextrose is presented. Physico-chemical and structural characterisation of the high-solid matrix was performed by small deformation oscillation on shear measured viscoelastic properties. A UV-Vis spectrophotometric method was employed to monitor the diffusion processes of ascorbic acid from the matrix to 50% (v/v) ethanol across temperatures ranging from -30°C to 20°C . All the above methods demonstrated that the pectin-polydextrose matrix retarded the vitamin diffusion near glassy state below -20°C . In contrast, the increment in vitamin mobility was clearly observed in the glass transition state due to the reduction in the matrix viscoelasticity. This fundamental concept of T_g and glassy state can be applied to preserve ascorbic acid in frozen foods and design controlled release particles in food supplements.

Stability of vitamin C in fresh and freeze-dried capsicum stored at different temperatures

P22

RAHMAN*, M.S., AL-RIZEIQI, M.H., GUIZANI, N., AL-RUZAIQI, M.S., AL-AAMRI, A.H. & ZAINAB, S.

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Vitamin C or ascorbic acid, a water soluble vitamin, is mainly present in fresh fruits and vegetables. It is most sensitive when the commodity is exposed to adverse handling and storage conditions. Vitamin C stability in fresh (moisture content: 94 g/100 g sample) and freeze-dried (moisture content: 5 and 15 g/100 g sample) capsicum was studied during storage at different temperatures (60, 45, 20, 5, -20 and -40°C). Fresh capsicum stored at 20°C showed an initial decrease in vitamin C with a minimum reached after two days and then increased to a peak followed by gradual decay after Day 15. In general, a gradual decrease of vitamin C was observed in the cases of fresh (i.e. stored at 5, -20 , -40°C) and freeze-dried capsicum stored at all temperatures (i.e. 60 to -40°C). The degradation kinetics were modelled by zero and first order reactions. At storage temperature 5°C , the first order rate constants were observed as 7.1×10^{-2} , 3.4×10^{-2} , and $4.6 \times 10^{-3} \text{ day}^{-1}$ for the moisture contents 94, 15 and 5 g/100 g sample, respectively. The rate constant decreased with the decreasing moisture content and storage temperature.