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"The Wonders and Opportunities of our Oceans"
Exhibition, 6 - 9 November 2010

SEAFOOD & HEALTH

INTERNATIONAL CONFERENCE AND EXHIBITION
MELBOURNE CONVENTION EXHIBITION CENTRE
AUSTRALIA 6-10 NOVEMBER 2010

International Seafood and Health Conference

"Creating a paradigm shift"

Seafood: Benefiting Health and Wellbeing

7 - 10 November 2010
Melbourne Convention and Exhibition Centre, Melbourne – Australia

Keynote
Speakers
Program
Venue *Abstracts*
Information

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Welcome

Our journey with this very important Conference and Exhibition reaches its climax now that we all gather in Melbourne and we hear from all the global experts on the latest information and research.

This international event in the heart of Melbourne, Victoria, Australia has presented a unique opportunity and we hope that we all come away from the event with a sense that we are on our way to **"Creating a Paradigm Shift"**

The International Seafood & Health Conference and Exhibition covers many issues and some may say, in hindsight, that we tried to cover too much, but if that is the case then we hope that we will be judged on the many positives that have been achieved by simply 'having a go'.

We have tried to organise this Conference to enable everyone who is present the prospect of being involved. Clearly that will be the opportunity on what might be termed 'Workshop Tuesday'. We hope you will all work hard at this event and to reward you we have organised excellent, nutritious food and drink and some interesting entertainment and fun along the way.

We hope you will come away from this event and feel you have been informed about the very latest medical research into all health aspects of the benefits of seafood, new discoveries and a deeper understanding of the health benefits of seafood which are occurring at a rapid rate. The environment is an extremely important subject when relating to seafood and we have chosen to take this subject to higher level as food security and sustainability should, we believe, be the goals. Human Behaviour and Communication strategies are the keys to success as moving the science and research through the industry chain to the public is something that must be achieved - 'The Wonders and Opportunities of our Oceans' Exhibition is essentially 'a toe in the water' concept to attempt this.

It has been a terrific learning experience bringing all this together and sharing this with our important sponsors, presenters, organisers, exhibitors, helpers, etc. We are very proud of what we have created and it has been a great pleasure to work with many positive people who have seen the vision and have been prepared to collaborate on achieving some special goals.

For the next few days it is about maximizing the potential from the energy that you will all bring and then it is about how we action what we have learned, how we will network with new and existing colleagues and what we can achieve by this collaboration – the work is ahead of us!

Kind Regards

Roy Palmer, FAICD
Conference & Exhibition Chairman
International Seafood & Health Conference

Contents

Rie Muñoz, *Loading Crab Pots*, 1990

Keynote speakers

Monday 8th November 2010

Professor Michael Crawford – Conference Patron
PhD CBiol, FIBiol, FRCPath, Founder and Director, Institute of Brain Chemistry and Human Nutrition. Consultant for WHO, FAO. Millennium Danone Chair at the University of Gent, Chair at the Albert Schweitzer International University in Geneva. Member of the DoH Committee on Borderline Substances.

Michael is one of the world's most eminent researchers into brain function and nutrition, with more than 300 publications, and is in strong demand as a speaker.

Professor Gilles Boeuf
Full Professor at the University Pierre et Marie Curie (UPMC), President of the National Natural History Museum (Muséum National d'Histoire Naturelle), Paris.

Research activities Environmental Physiology in fish, development, growth, osmorégulation, excrétion, chronobiology; physiology and endocrinology of development and growth in fish; salmonid smoltification; inner ear otolith-otocac complex in fish; scientific programmation for research dedicated to aquaculture; biodiversity, both marine and terrestrial. Regular collaboration with teams in France, Switzerland, US, Norway and Chile. Recently, invitations for teaching, research evaluation and collaborative programs with teams in Switzerland, Spain, Chile, Oman, Italy, Japan, New Caledonia and French Polynesia, Belgium, South Korea, Mexico, Egypt, Australia, Colombia, Taiwan...

Professor David Hughes
David is: a non-Executive Director of KGG Limited, a farmer-owned and Europe's largest fresh berry business (turnover US$ 260 million in 2006); and co-owner and Director of a small property development business in Canada.

He is a frequent keynote speaker at major national and international food industry seminars and conferences around the globe. He works closely with food industry firms on the development of marketing strategies, building partnerships in the food industry, and with governments on food policy formulation. He is a proponent of building strong vertical alliances – partnerships – in the food industry; between consumers and agribusiness, the farm sector, manufacturers, food service and retail. He has many articles/chapters published in notable national and international journals and books and is a Visiting Professor at the University of Kent Business School and a Visiting Professor at the Royal Agricultural College, Cirencester, U.K.

Tuesday 9th November 2010

CAPT Joseph R. Hibbeln
Acting Chief, Section on Nutritional Neurosciences, LMBB, NIAAA, NIH

CAPT Joseph R. Hibbeln, M.D is Acting Chief, Section of Nutritional Neurochemistry in the Laboratory of Membrane Biophysics and Biochemistry at the National Institutes of Health. Dr. Hibbeln originated the field of omega-3 fatty acids in depressive and aggressive disorders and has contributed more than 75 peer-reviewed scientific papers.

His interests include the benefits of fish consumption during pregnancy in supporting higher IQ among and more optimal social behaviours among the children. He is a co-author of the US Food and Drug's recent evaluation that the benefits of seafood during pregnancy outweigh the risks of typical methyl mercury exposure. He participated in developing American Psychiatric Association treatment recommendations by the for omega-3 fatty acids in 2006.

His interests have included the cross-national comparisons of seafood consumption to rates of psychiatric illnesses, epidemiological comparisons with in countries, depletion of omega-3 fatty acids during pregnancy as a reversible cause of depressions associated with pregnancy.

Keynote speakers

Dr Lahsen Ababouch
Professor Lahsen Ababouch leads the Fish Products, Trade and Marketing Service at the United Nations Food and Agriculture Organization (FAO) in Rome, Italy.

Before joining FAO in June 2000, he was Professor at the King Hassan II Institute of Agronomy and Veterinary Medicine, in Rabat, Morocco, where in addition to teaching and research, he held advisory positions for research, industry outreach, bilateral trade agreements and agribusiness. He has written some 94 scientific publications, including books and book chapters, and some 174 scientific and technical communications in seafood technology, safety and quality. In 1996, he was awarded the King Baudouin Award for Excellence in Research by the International Foundation for Science (IFS, Stockholm, Sweden); in 2004, the Distinguished Leadership Award for Internationals by the University of Minnesota (USA) and in 2009, the Special recognition Award of the International Association of Fish Inspectors. He has wide experience in training, research, technical assistance and capacity building in fish and seafood technology, safety and trade, in over 60 developing countries in Africa, the Middle East, Asia and the Pacific.

Dr Joyce A. Nettleton
is a specialist in seafood nutrition and science communications who has an independent consulting practice, ScienceVoice Consulting, in Denver, CO.

Joyce Nettleton is well known for her work in seafood nutrition and omega-3 fatty acids since the publication of her first book, Seafood Nutrition, in 1985. Her third book, Omega-3 Fatty Acids and Health, was published 10 years later. Joyce has published scientific articles on seafood composition, omega-3 fatty acids and type 2 diabetes, and mercury in seafood. She is currently editor of two science-based electronic newsletters specializing in polyunsaturated fatty acids, the PUFA Newsletter for health professionals and Fats of Life for consumers. Both are freely accessible at www.fatsoflife.com. Joyce is a frequent guest speaker on omega-3 fatty acids and health and is often quoted in the news media about the health benefits of seafood. Joyce holds a doctorate in nutrition science from the Harvard School of Public Health and a Masters in International Nutrition from Cornell. In 1999, she was elected Fellow of the American Association for the Advancement of Science. When she is not eating seafood, she is chasing the black diamonds on Colorado's ski slopes or trying to master the art of Argentine tango and Spanish.

Wednesday 10th November 2010

John Paul SanGiovanni
National Eye Institute, NIH, Bethesda, United States of America

John Paul SanGiovanni recently received the Early Career Award from the International Society for the Study of Fatty Acids and Lipids. He received the Director's Award at the U.S. National Institutes of Health (NIH) in 2008. He serves in the Clinical Trials Branch of the U.S. National Eye Institute. Dr. SanGiovanni's primary scholarship interest is in understanding the role of dietary factors in development and prevention of visual system disorders. His primary research interest is in examining the relationship of long-chain polyunsaturated fatty acids (LCPUFAs) and associated bioactive molecules with pathogenic processes implicated in retinal vascular diseases. He leads analysis teams for the Age-Related Eye Disease Study (AREDS) and AREDS2 in projects examining the relationship of dietary factors with age-related macular degeneration (AMD) and cataract. In addition to this work, Dr. SanGiovanni is conducting large-scale genomic studies on the role of lipid-associated genes and mitochondria in pathogenesis of AMD. He served as Project Officer of AREDS and now co-directs AREDS2, a 4000-person, 5-year phase III randomized clinical trial on the safety and efficacy LCPUFAs in the prevention of sight-threatening AMD.

He is conducting mechanistic studies on diet and retinal angiogenesis in a number of cellular and animal models. Dr. SanGiovanni has participated as a technical expert for numerous U.S. government-directed projects, including an evidence report on omega-3 fatty acid intake and eye health from the Agency for Healthcare Research and Quality and a research symposium on the role of omega-3 fatty acids in health and disease planned by the National Center for Complementary and Alternative Medicine. Prior to his appointment at NIH in 2000, Dr. SanGiovanni held positions at Harvard Medical School, the International Nutrition Foundation, and The United Nations University.

Dr. SanGiovanni earned his doctorate and masters degrees at the Harvard School of Public Health. His dissertation research was on the relationship of diet with visual resolution acuity in infancy. Prior to completing his degrees he conducted psychophysical research at The Children's Hospital (Boston) and Harvard Medical School Department of Ophthalmology.

Paul Holthus
Executive Director, World Ocean Council, Honolulu, USA

Paul is founding Executive Director of the World Ocean Council which brings together the diverse international ocean business community in a cross-sectoral leadership alliance for ocean stewardship. The World Ocean Council is fostering leadership and collaboration on "Corporate Ocean Responsibility" and catalyzing industry action on specific marine environmental challenges in support of improved business operations.

Paul works with the private sector to develop practical solutions for achieving sustainable development and addressing environmental concerns, especially for marine areas and resources. His experience ranges from working with the global industry associations or directors of UN agencies to working with fishers in small island villages. He has worked with companies, industry associations, UN agencies, international NGOs and foundations on coastal and marine sustainable development in over 30 countries in Asia, the Pacific, Europe, North America, Central America and Africa.

Past positions include: International consultant on environment, sustainability, standards and certification for a range of ocean users (e.g. oil, aquaculture, fisheries, navy) and international agencies (e.g. UNDP, FAO); Deputy Director for the Global Marine and Coastal Program of IUCN - The World Conservation Union; Senior Officer in the Asia-Pacific Program of The Nature Conservancy; Senior Program Officer of the UNEP South Pacific Regional Environment Programme (SPREP); and founding Executive Director of the Marine Aquarium Council (an international business/environment organization creating standards and certification for the live fisheries trade). Paul graduated from the University of California and the University of Hawaii, with advanced degrees in coastal/marine resources and international business.

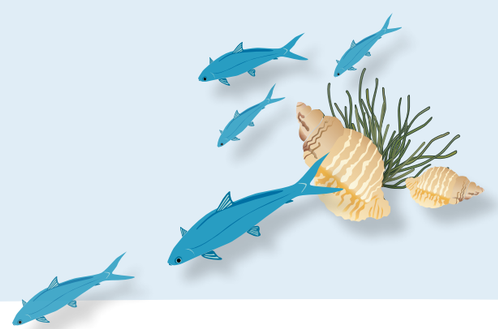
Assoc Professor Shakuntala Haraksingh Thilsted
Director of Nutrition, World Fisheries Centre, Dhaka, Bangladesh

Shakuntala has only just taken up her role with the World Fisheries Centre having been previously with the Department of Nutrition, Faculty of Life Sciences at University of Copenhagen, Denmark for 17 years. Prior to that role she had been employed as Short-term Nutrition Consultant, International Fund for Agricultural Development (IFAD), Italy and Nutrition Coordinator, International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B).

A/P Thilsted completed her education at (Physiology of Nutrition), Department of Animal Science, The Royal Veterinary and Agricultural University (Faculty of Life Sciences, University of Copenhagen), Denmark.

Her Research interests are:

- Promoting the linkages between health, nutrition and agriculture, including fisheries
- Implementation of food-based strategies, focusing on nutrient contribution and bioavailability of micronutrients from commonly consumed foods for improved nutrition in low income countries
- Assessment and evaluation of food and nutrition security in low income countries
- Advocacy and formulation of policies, strategies and programmes which incorporate nutrition for reducing hunger and malnutrition in low income countries
- Strengthening capacity building within food and nutrition security in low income countries



Program

Monday 8th November 2010

08.30 - 10.45 | Room 212 & 213 | Opening Plenary and Welcome			
S&H News followed by Prof Michael Crawford, Prof Gilles Boeuf, Prof David Hughes | Room 212 & 213			
10.45 - 11.15 | Morning tea served in the exhibition area			
11.15 - 12.45 | Concurrent sessions (3 Streams)			
	1. HNMS&R, Room 212 & 213 (Chair: Prof Sean Strain)	**2. FS&S, Room 219** (Chair: Ted Loveday)	**3. HB&C, Room 216** (Chair: Dr Wendy Newton)
11.15	Prof Maria Makrides	Prof Robert Kearney	Christopher Leftwich
11.40	Prof Tom Brenna	Dr Patrick Sorgeloos & Dr Geoff Allen	Dr Kate Brooks
12.05	A/Prof Barbara Meyer	A/Prof Alexandra McManus	Elizabeth Neale
12.30	Panel discussion	Panel discussion	Panel discussion
12.45 - 13.30 | Working lunch served in the exhibition area			
13.30 - 15.30 | Concurrent sessions (3 Streams)			
	1. HNMS&R, Room 212 & 213 (Chair: Prof Tom Brenna)	**2. FS&S, Room 219** (Chair: Prof Robert Kearney)	**3. HB&C, Room 216** (Chair: Dr Nicholas Ralston)
13.45	Prof Clemens von Schacky	Prof Steve Kennelly	David Martosko
14.00	Dr Michael Gardner	A/Prof Todor Vasiljevic	Prof Colin Barrow
14.20	Dr Les Cleland	Simone Osbourne	Prof Sean Strain
14.50	Dr J Helen Fitton	Suchetana T. Chattopadhyay	Amanda Johnson
15.10	Panel discussion	Panel discussion	Lea Starck
15.30 - 15.45 | Afternoon tea served in the exhibition area			
15.45 - 17.30 | Concurrent sessions (3 Streams)			
	1. HNMS&R, Room 212 & 213 (Chair: Dr Les Cleland)	**2. FS&S, Room 219** (Chair: Prathapachandra Shetty)	**3. HB&C, Room 216** (Chair: A/Prof Meredith Lawley)
15.45	Prof Trevor Mori	Steve Nel	**Workshop 1, Room 216** **Understanding the seafood consumer** Presenters: A/Prof Meredith Lawley and Dr Dawn Birch
16.05	Isabelle Baur	Dr Tom Lewis	
16.20	Prof Lynne Cobiac	Simone Rochfort	
16.35	Dr Alice Owen	Pia Winberg	
16.50	Lily Chan	Grant Leeworthy	
17.05	A/Prof Alexandra McManus	Dr Kate Barclay	
17.20	Panel discussion	Panel discussion	Workshop Conclusions
17.30 | Close			
18.30 - 20.30 | Room 212 & 213 | Public Forum with Jon Faine interviewing Professor Michael Crawford, Prof Sean Strain, Professor Clemens von Schacky, Captain Joe Hibbeln, Professor Tom Brenna and Professor Shakuntala Thilsted – door proceeds going to Aquaculture without Frontiers			

S&H News

It is impossible to cut yourself into three to follow the entire program so we have organised some specialists who will each follow one of the themes and give their succinct comments on what they thought were the important issues. This will happen on a daily basis. Martin Bowerman and/or Roy Palmer will anchor the S&H News and the reporters for each theme are:

Health, Nutrition and Medical Science & Research (HNMS&R): John Sackton, Editor & Publisher, Seafood News
Food Security and Sustainability (FS&S): Alastair Macfarlane, General Manager, NZ SeaFIC
Human Behaviour and Communications (HB&C): Brian Wexham, CEO, The Institute for Trade Skills Excellence Ltd

Tuesday 9th November 2010

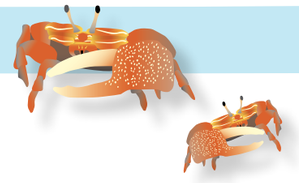
08.30 - 10.15 | Room 212 & 213 | Opening Plenary and Welcome		
S&H News followed by Captain Joe Hibbeln M.D., Dr Lahsen Ababouch, Joyce Nettleton | Room 212 & 213		
10.15 - 10.30 | Morning tea served in the exhibition area		
10.30 - 12.45 | Workshops 2 & 3		
Workshop 2, Room 212 & 213 **Mercury** (Chair: David Martosko) Presenters: Prof Steve Otwell; Dr Iqbal Ahmed; Prof Tore Syversun; Dr Nicholas Ralston; and Prof Sean Strain.	**Workshop 3, Room 219** **Seafood Issues – food safety, allergies, etc** (Chair: Jayne Gallagher) Presenters: Barbara Montwill; Dr Wendy Newton; Shan Shan Sun; Dr Toshikazu Komoda; Sandip Kamath and Shruti Sapatarshi.	
12.45 - 13.45 | Working lunch served in the exhibition area		
13.45 - 15.30 | Workshop 4		
Workshop 4, Room 212 & 213 **Consumer perceptions: Health Claims, food regulations, new technologies and barriers to consumption** (Chair Dr Trevor Webb) Presenters: Hazel Fowler; Lydia Buchtmann; A/Prof Alexandra McManus; and Craig Cormick		
15.30 - 15.50 | Afternoon tea served in the exhibition area		
15.50 - 16.30 | Outcomes from the Expert Consultation on the Risks and Benefits of Fish Consumption (Prof Andrew Sinclair) Presenters – Jogeir Toppe & David James – FAO (Room 212 & 213)		
16.30 - 17.15 | Guest Keynote – Dr Roberto Leonardi (Room 212 & 213)		
17.15 | Close		
19.30 - 23.30 | Room 201 | Gala Dinner		

Wednesday 10th November 2010

08.30 - 10.15 | Room 212 & 213 | Opening Plenary and Welcome			
S&H News followed by John Paul SanGiovanni, Paul Holthus, A/Prof Shakuntala Thilsted | Room 212 & 213			
10.15 - 10.45 | Morning tea served in the foyer area opposite rooms 212 & 213			
10.45 - 13.45 | Concurrent sessions (3 Streams)			
	1. HNMS&R, Room 212 & 213 (Chair: Cptn Joe Hibbeln)	**2. FS&S, Room 219** (Chair: Grahame Turk)	**3. HB&C, Room 216** (Chair: Angus Callander)
10.45	Dr Leigh Broadhurst	Bill Passey	David Martosko
11.05	Dr Natalie Sinn	David Carter	Jennifer McGuire
11.20	Dr Felice Jacka	Randy Rice	Avinna Trzesinski
11.35	Dr Flavia Fayet	Ted Loveday	Nick Ruello
11.50	Gunveen Kaur	Alistair MacFarlane	Dr Anne Katrin Schlag
12.05	Ms Elizabeth Neale	Linda Sams	James White
12.20	Panel discussion	Panel discussion	Panel discussion
12.30 - 13.15 | Working lunch served in the foyer area opposite rooms 212 & 213			
13.15 - 16.00 | Concurrent sessions (3 Streams) and Final Conference Roundup			
	1. HNMS&R, Room 212 & 213 (Chair: Prof Michael Crawford)	**2. FS&S, Room 219** (Chair: Justin Fromm)	**3. HB&C, Room 216** (Chair: Norm Grant)
13.15	Masaaki Tagata	Prof Giovanni Turchini	Brian Wexham
13.35	Catherine Milte	Dr Peter Nichols	Tom Kime
13.55	Dr Jessica Grieger	Prathapachandra Shetty	John Sackton
14.15	Prof Andrew Sinclair	Dr Geoff Allan	Sophie Halls-Anning
14.35	Prof Michael Crawford	Mark Oliver	Natalie Johnson
14.50	Panel discussion	Panel discussion	Panel discussion
15.00 | Room 212 &213 | Final session – Where to from here?			
16.00 | Close			

Speakers

Monday 8th November 2010 – Morning Sessions



8 Nov
11.15 - 12.45
Room 212 & 213

Health, Nutrition and Medical Science & Research (HNMS&R)

Prof Sean Strain
Chair Person

8 Nov, HNMS&R
11.15 - 11.40
Room 212 & 213

Omega-3 fatty acids: what are the messages for pregnant women and their infants?

Prof Maria Makrides
Professor of Human Nutrition
University of Adelaide, Australia

Maria Makrides is a NHMRC Senior Research Fellow and Deputy Director of the Women's & Children's Health Research Institute. She is also the Professor of Human Nutrition at the University of Adelaide. As a research dietitian, Maria is committed to improving the nutrition and health of mothers and their babies through the translation of high quality research. She has published widely and her work has been recognised nationally and internationally with a number of prestigious awards and appointments. She currently serves on the Board of Directors of the International Society for the Study of Fatty Acids and Lipids (ISSFAL) and is a member of the Nutrition Committee, Australian Academy of Science. Maria currently leads 4 national large-scale trials in the area of perinatal nutrition funded by the NHMRC.

8 Nov, HNMS&R
11.40 - 12.05
Room 212 & 213

Humans require omega-3 docosahexaenoic acid to achieve optimal brain and retina fatty acid composition
Prof J. Thomas Brenna
Division of Nutritional Sciences
Cornell University

Human neural tissue is rich in the omega-3 fatty acid docosahexaenoic acid (DHA). Deficiency of omega-3 fatty acids manifest via impairment in functions, and include poor visual function, learning and memory, and higher psy-chiatric function such as mood. DHA is a key component of neural membranes and also serves as a precur-sor for highly bioactive signaling molecules.

DHA can be acquired from the diet or be made in the body from shorter chain omega-3 fatty acids. Until recently, it was widely believed that supplementation of the diet with -linolenic acid (ALA) or longer chain omega-3 such as eicosapentaenoic acid (EPA) could be converted to DHA. Dozens of studies in adults now show that supplemental omega-3 other than DHA do not appreciably increase blood measures of DHA, though they do increase EPA levels. Importantly, studies in infants indicate that they can improve their DHA status with provision of ALA. However, infants fed formulas without DHA do not achieve a DHA status similar to those of breastfed ba-bies. DHA is always present in breastmilk.

The desaturase activities are key biochemical regulators DHA biosynthesis from ALA. We have recently discovered novel alternative transcripts (AT) of the fatty acid de-saturase (FADS) genes. FADS2, coding for 6 and 8-desatura-tion, has at least one AT. FADS3 has at least eight AT, and while its function is yet to be discovered, we have recently found that its mRNA is found in association with the ribosomes, the cell's protein synthetic apparatus. New mea-surements also show that FADS1, cod-ing for 5-desaturase activity, has multiple AT as well. AT expand function and molecular regulation of genes. The FADS AT are molecular intermediates that are likely to be key mediators of long chain polyunsaturated fatty acid biosynthesis. FADS AT levels in humans are likely to be valuable in assessing those in most need of the nutrients that are uniquely rich in seafood.

8 Nov, HNMS&R
12.05 - 12.30
Room 212 & 213

Australian children are not consuming enough long chain omega-3 polyunsaturated fatty acids for optimal health
Barbara J. Meyer
School of Health Sciences and Metabolic Research Centre
University of Wollongong

The 2007 Australian National Children's Nutrition and Physical Activity Survey is the first national survey of Austra-lian children's nutrition since 1995. The National Health and Medical Research Council Nutrient Reference Values include Adequate Intakes (AI) for all ages and Suggested Dietary Targets (SDT) for persons 14 years and over for long chain omega-3 polyunsaturated fatty acid (LC n-3 PUFA).

To determine the children's PUFA intakes in comparison to AI and adjusted SDT and to determine if intakes between children of different body weight and physical activity levels differed.

The necessary data files were obtained from the Australian Social Science Data Archive and were merged for 4486 children aged 2-16 years, with physical activity data collected only for children aged 5-16 years.

The median (interquartile range) PUFA intakes for 2-3 yrs, 4-8 yrs, 9-13 yrs, 14-16 yrs are as follows: linoleic acid (LA, g) 4.7 (3.5-6.2), 6.0 (4.4-8.1), 7.1 (5.3-9.7), 8.5 (6.0-11.3) respectively; alpha-linolenic acid (ALA, g) 0.75 (0.57-1.0), 0.91 (0.67-1.2), 1.02 (0.73-1.42), 1.15 (0.81-1.62) respectively; LC n-3 PUFA (mg) 56 (29-104), 68 (37-128), 88 (46-159), 98 (49-190) respectively. Children met the AI for LA and ALA, but only 50% of children met the AI for LC n-3 PUFA. Furthermore, only 6% of children met the energy adjusted SDT for LC n-3 PUFA per day and these children consumed 10 times more fish/seafood than children who did not meet the energy adjusted SDT for LC n-3 PUFA. Comparison of LC n-3 PUFA tertile intakes showed no differences in intakes in different weight categories and physical activity levels.

The majority of Australian children are not consuming enough LC n-3 PUFA for optimal health.

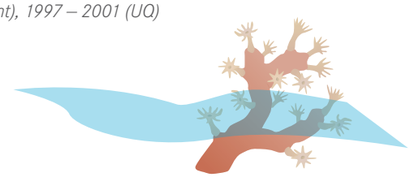
8 Nov
11.15 - 12.45
Room 219

Food Security and Sustainability (FS&S)

Ted Loveday
Chair Person
Managing Director at Seafood Services Australia Ltd
Masters , Environmental Management (Sustainable Development), 1997 – 2001 (UQ)

8 Nov, FS&S
11.15 - 11.40
Room 219

Sustainable fish, fisheries or seafood?



Prof Robert Kearney
Emeritus Professor in Fisheries Management
University of Canberra, Australia

Australian marine fish have proven remarkably resilient to fishing. Our fisheries management has a reputation for being amongst the best in the world. Yet the gap between our fisheries production and our seafood consumption continues to widen at a time when international competition for limited global seafood supplies is escalating. In spite of this obvious conundrum we have no national policies or strategies for seafood security.

Has the resilience of our oceans resulted in a false sense of security and masked our poor performance as sustainable seafood managers?

Have our fish survived in spite of our lack of proper understanding of how to protect and sustainably use them? Is our reputation as good fisheries managers a fortuitous result of our geographic isolation and not good science or policies? Has proper consideration of seafood security been distorted by an NGO industry that gains from creating and fuelling the public perception that fishing is inherently environmentally irresponsible? Or have our fisheries management agencies and semi-government authorities been silenced by the displacement of the public service with the government service?

The lack of strategic planning and actions by governments has allowed the NGO industry to distort public perceptions of the management of our oceanic resources. This has been aided by inadequate national seafood industry cohesion and strategic vision to the extent that the short term interests of sections of the fishing industry, often distorted by an unhealthy dependence on government handouts, has actually led to property rights management working against the interests of seafood consumers.

Australians need a sustainable supply of seafood but to achieve it much more strategic approaches will be required.

8 Nov, FS&S
11.40 - 12.05
Room 219

Seafood supply from aquaculture: a global assessment of resources, technology and services needed for future development[1]

Dr Geoff L. Allan* and Dr Patrick Sorgeloos
**Industry & Investment NSW*
Port Stephens Fisheries Institute Australia

Global aquaculture development has been impressive with growth exceeding that of all other food producing sectors. From less than 10% in the 1970's to nearly 50% today, aquaculture is supplying an increasing proportion of the seafood consumed worldwide. Total production for 2008 was estimated by FAO (FAO - FISHSTAT, 2010) at 68.3 Mt (million tonnes) worth US$106 billion. However, with global population growth and increasing per capita consumption, and static production from capture fisheries, aquaculture production will need to continue to grow rapidly if global demand for seafood is to be met. This presentation will review production and discuss opportunities and the key technical challenges to growth.

One way of categorizing aquaculture is as "food" aquaculture or "business" aquaculture. This oversimplification is useful to help show the huge importance of aquaculture for food security. Food aquaculture includes the millennia-old tradition of farming freshwater fish in ponds in Asia for domestic consumption. This provides close to 15 Mt in China alone. It also included integrated aquaculture where pond productivity is enhanced through nutrients from livestock or other agricultural production (e.g. farming fish in ditches and in rice paddies). The business category was pioneered in Japan in the 1960's and includes more capital intensive aquaculture conducted primarily for profit. Business aquaculture has become possible through advances in technology for breeding, feeding, new production systems and improved understanding of aquatic health management. It usually relies on external markets and often on supply of inputs from other regions or even other countries.

With the growing population, available water and land for food production will come under increasing pressure. However, the vast area of seas and oceans can be developed to provide an increasing proportion of human food needs. What needs to be done to ensure this is possible and can be achieved with acceptable impacts on the environment and human health? Most important is the need to develop a more knowledge based bio-industry; to understand the underlying mechanisms in all the biological processes responsible for the final production outcome. Specific priorities to help achieve this will be discussed. These include: domestication; improved seed production; better, more targeted species selection; selective breeding; improved microbial management; better understanding of immune systems for vertebrates and invertebrates; more integrated production systems; coastal and off-shore farms for food and energy; independence from capture fisheries for lipid and protein ingredients in aquatic feeds; more coordination of restocking activities with fisheries management, and improved multi-stakeholder interaction and international cooperation.

[1]The presentation is based on the plenary lecture given by Professor Patrick Sorgeloos, Ghent University, Belgium, for the FAO Global Conference on Aquaculture 2010, held in Phuket, Thailand 22-25 September 2010.

8 Nov, FS&S
12.05 - 12.30
Room 219

The future of seafood in food security and sustainability

A/Professor Alexandra McManus
Centre of Excellence for Science, Seafood and Health
Curtin University Australia

Predictions of global population growth, climatic change, human activity and pollution augment concern about food security in the seafood sector. A history of overexploitation of fishery resources has resulted in 63% of fish stocks in need of rebuilding. Fisheries across the globe employ millions of people and the fish provided supports more than 20% of daily protein requirements to over one third of the world's population. In developing countries, the proportion of dietary protein derived from fish is relatively greater than developed countries and the proportion of people dependant on fisheries and aquaculture for employment is also higher. This paper will review the complex and multi-faceted topic of marine sourced food security.

The global population is predicted to reach 9.1 billion by 2050 and concurrently, global demand for food is predicted to treble. The largest increases in population are expected in less affluent regions giving rise to concerns about food security, sustainability and equity. Issues of sustainability and the influence of human activity on marine resources are both highly controversial and long standing.

Fish and seafood are crucial to global food security yet it is estimated that 30% of fish stocks yield less than 10% of their previous potential. In fact, only 25% of commercial stocks considered to be in a healthy or reasonably healthy state. This presentation will provide an overview of the role of fish and seafood in global food security.

8 Nov
11.15 - 12.45
Room 216

Human Behaviour and Communications (HB&C)

Dr Wendy Newton
Chair Person
Dr Wendy Newton is Senior Food Microbiologist with the Centre of Excellence for Science Seafood & Health, a national centre housed within Curtin University.

8 Nov, HB&C
11.15 - 11.40
Room 216

Where we have come from - the good old days

Chris Leftwich
Chief Inspector to the Fishmongers' Company
London, England

In this paper I will do a brief presentation on the historical importance of seafood in the diet of the population of London coupled with the history of the Fishmongers' Company. I will then talk about some of the initiatives that we have introduced and the work we are undertaking to try and get people to eat more seafood particularly at a younger age.

8 Nov, HB&C
11.40 - 12.05
Room 216

"It isn't business as usual: Shifting the paradigms of the Seafood Industry and doing things differently"

Dr Kate Brooks
Visiting Fellow
Australian National University

The Australian Seafood industry has undergone massive change in the last twenty five years: from one of a largely unquestioned place in Australia's food production and basis, to one of a challenged and threatened activity in a highly contested resource space. While industry laments the lack of understanding and empathy for its objectives and role in providing a staple protein and food source to Australians; society at large – civil and political – don't get it.

Kate Brooks will talk about changing industry paradigms to begin addressing this tension and moving away from the usual forms of doing business, to begin to achieve better outcomes. Lessons and ideas explored here may have relevance for many other country's fisheries sectors, and can also be used in downstream support and allied industries. She will identify and explore some business tools that can be used to help understand our capacity – individual and industry – to address shifting paradigms - ours and of those around us – and assist in creating flexibility and mitigating the risks of a changing operating environment in the seafood industry.

Topics dealt with:

- Our learning environment
- What is Social capital and how to understand it?
- Gate keeping
- Understanding Operating environments and perceptions

"A man should look for what is, and not for what he thinks should be." (or)
"To raise new questions, new possibilities, to regard old problems from a new angle, requires creative imagination and marks real advance in science." *Albert Einstein*

8 Nov, HB&C
12.05 - 12.30
Room 216

Motivators and barriers to fish and seafood consumption within participants of a clinical weight loss trial and university staff members

Elizabeth Neale
Smart Foods Centre
University of Wollongong Australia

Habitual fish consumption is associated with improved cardiovascular health outcomes, resulting in the development of fish intake recommendations by health organisations such as the National Heart Foundation. However, food consumption data suggests that Australians are not meeting these recommendations. In a recent clinical trial targeting fish consumption (the SMART trial, ACTRN12608000425392), we found many participants were still not consuming the recommended amount of fish, despite regular nutritional counselling sessions. The aim of this study was to qualitatively investigate factors which motivated or served as barriers to fish consumption for these clinical trial participants, and compare these to those expressed by staff members from the host institution.

Three semi-structured focus groups were conducted each for participants of the SMART study (n = 15) and staff of the University of Wollongong (n = 14), giving a total of six focus groups. Staff members were selected if they were not involved in or aware of the SMART study. All data was recorded digitally and transcribed verbatim by the moderator. Data analysis was carried out using NVivo (Version 7.0, QSR International Pty Ltd, Melbourne, Australia, 2007). Factors influencing fish consumption were coded into a number of themes, which were then categorised as motivating factors or barriers to consumption.

For both participants of the SMART trial and University staff, the perceived health benefits of fish were the most commonly addressed motivating factor. The convenient nature of specific fish products, particularly canned fish also ranked highly as a motivator for both groups. The trial participants also added education and awareness of health benefits of fish as important motivating factors. For trial participants, the price of fish and seafood was the most commonly discussed barrier to regular fish consumption. Price also ranked highly for University staff members, however, the preferences of family members, in particular children, was the most commonly discussed barrier to fish consumption for this group. Access to fresh fish was also an important barrier to consumption for both groups, with fish being described as a food which was much more difficult to access than meat, despite the close geographical proximity to the ocean.

Motivators and barriers to fish consumption were similar for participants of a clinical trial and University staff. Perceived health benefits of fish were an important motivator, whilst price of fish and seafood and family preferences were a substantial barrier. Education in relation to the health impacts of fish consumption only ranked highly for trial participants, which may be reflective of the nutritional counselling they received during the study.

Funding source: The SMART study was funded by a NHMRC project grant (514631) Tapsell, Batterham, Charlton.

Monday 8th November 2010 – After Lunch Sessions

8 Nov
13.45 - 15.30
Room 212 & 213

Health, Nutrition and Medical Science & Research (HNMS&R)

Prof J. Thomas Brenna
Chair Person

8 Nov, HNMS&R
13.45 - 14.00
Room 212 & 213

Omega-3 fatty acids – how to use a key to heart health

Prof Dr Clemens von Schacky auf Schönfeld
Head, Preventive Cardiology
University of Munich, Germany

Board Certifications (Bayerische Landesärztekammer, Munich)

03/92	Internal Medicine
03/96	Cardiology
01/99	Angiology

Career

03/83 - 05/86	PostDoc with Prof. P.C. Weber, University of Munich, and with Prof. A.J. Marcus New York, NY, USA,
06/86 – 11/04	Med Clinic Innenstadt, University of Munich
04/97 – 11/04	Senior physician at Med Clinic Innenstadt, University of Munich
01/98 – 09/00	Head, Dept of Cardiology, Reithofpark-Klinik, Bad Feilnbach
10/02 – 11/04	Senior physician at Med Clinic and Med Policlinic Innenstadt, University of Munich
11/04 - 09/06	Chief, Dept. Int. Medicine/Cardiology, Medical Park St Hubertus, Bad Wiessee
01/87 -	Head, Preventive Cardiology, University of Munich
01/07 -	Founder and CEO Omegametrix, Martinsried, Germany

Committee
Member, prevention panel, German Cardiac Society (generating pertinent guidelines)

Societies
Fellow, American Heart Association/Arteriosclerosis, Thrombosis and Vascular Biology Council; Fellow, European Society for Cardiology; European Cardiologist; Member, Board of Directors ISSFAL (International Society for the Study of Fatty Acids and Lipids) 1997 – 2001, 2008-; German Cardiac Society, Lipid-Liga, others.

Research supported by
Deutsche Forschungsgemeinschaft, Bundesministerium für Forschung und Technologie, National Institutes of Health, Wilhelm Sander-Stiftung, Fondacion Federico, Münchner Universitäts-Gesellschaft, Pharmaceutical Industry, others.

Publications: 80 in medline, approx. 100 others (abstracts, chapters in (text)books, asf.)

Research topics: Cardiovascular prevention, aspirin, omega-3 fatty acids, postmenopausal hormone replacement, clinical studies, participation in large multi-center trials (EUROPA, METEOR, ADVANCE, Beautiful, ORIGIN, others)

München, March 8, 2010

8 Nov, HNMS&R
14.00 - 14.20
Room 212 & 213

Prevention and treatment of coronary artery disease by a cardiac surgeon and professional fisherman

Michael Gardner (MBBS FRACS)
Queensland Seafood Industry Association & Cardiac Surgeon

Michael Gardner is a Cardio-Thoracic Surgeon and former Director of Cardiac Surgery St Andrews Hospital and former visiting medical officer to Prince Charles Hospital, Brisbane.
He is a professional fisherman and operates his own line fishing vessel off the south Queensland coast.
He is also President of the Queensland Seafood Industry Association.

The major cause of mortality in Australia is still heart disease and in particular Coronary Artery Disease. This is produced by a build up of cholesterol deposits which form plaques in the wall of the coronary arterial vessels which supply blood to the myocardium(heart muscle). These plaques behave in an unpredictable manner and can produce narrowing or occlusion of the vessel lumen either slowly or suddenly which impacts on the supply of blood and oxygen to the heart. This can result in chest pain called angina or a heart attack known as myocardial infarction.

The diagnosis requires coronary angiography and the treatment will depend on the severity, number, and location of these plaques. Coronary bypass surgery(open heart surgery) will be required for severe multiple vessel involvement and while it does not cure the disease, it provides symptomatic relief , an improved quality of life and in many instances a prolongation of life. In a lifetime career as a cardiac surgeon I have performed a large number of bypass operations.

One of the risk factors for coronary disease is a diet high in saturated fat. It is well proven that a diet incorporating seafood high in omega 3 oils has a preventive effect on coronary disease.
Now, as a professional fisherman and through my role in the Queensland Seafood Industry Association I am focusing on aspects of the prevention of this common disease by both providing fresh seafood to the community and promoting its consumption.

8 Nov, HNMS&R
14.20 - 14.50
Room 212 & 213

The Use of Fish and Fish Oil in the Management of Arthritis and Inflammatory Diseases

Prof Les Cleland
Director of Rheumatology
Royal Adelaide Hospital, Australia

Graduated MB BS and MD at the University of Adelaide. Director of Rheumatology, Royal Adelaide Hospital since 1982. Clinical Professor, University of Adelaide since 2000. The anti-inflammatory effects and cardiovascular benefits of long chain omega-3 fatty acids found in fish and fish oil is a long term clinical and research interest.

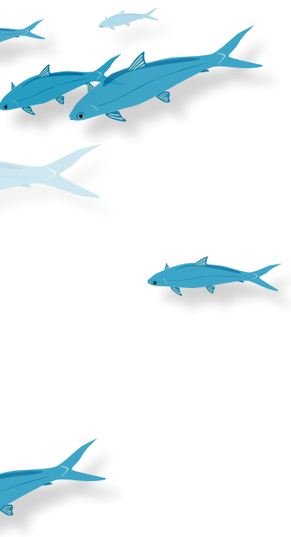
Further professional interests include systems for cost-effective, safe management of rheumatoid arthritis and other inflammatory diseases and the place of anti-inflammatory doses of fish oil therein. The extent of and mechanisms underlying the cardiovascular toxicity of nonsteroidal anti-inflammatory drugs (NSAIDs) has been a particular interest, along with strategies for utilising anti-inflammatory/analgesic doses of fish oil to mitigate this risk and as a substitute for NSAIDs in the management of chronic musculoskeletal pain.

Erstwhile appointments include President Australian Rheumatology Association; Honorary Medical Director, Arthritis Australia; Member, Advisory Committee to Department of Health and Ageing for National Health Priority for Arthritis and Osteoporosis; and numerous journal and research funding review panels. Current commitments include membership of the Economics Sub-committee of the Pharmaceutical Benefits Advisory Committee.

8 Nov, HNMS&R
14.50 - 15.15
Room 212 & 213

Immunomodulatory effects of seaweed extract nutrient complex – A Combined Phase I and II open label study

Dr J Helen Fitton
Marinova Pty Ltd
Cambridge, Australia



Marine algae have been used by humans as both a food and medicine for thousands of years. The population of Japan consume seaweed or 'macroalgae' every day with daily consumption averaging 14.2g.[1] A recent epidemiological study found that dietary seaweed was associated with lowered all cause mortality and lower mortality from lung cancer for men and women, for pancreatic cancer for men and for cerebrovascular disease for women.[2] Brown marine algae in the form of seaweed extracts have been shown in animal studies to have a marked anti-tumour effect when delivered either intravenously or orally, an effect partly attributed to stimulation of both innate and specific immunity.

Maritech® extract formulation containing a blend of extracts from three different species of brown algae plus nutrients was assessed in an open label combined Phase 1 and 2 study to determine both acute safety and immunomodulatory effects. (Australian and New Zealand Clinical Trials Register: ACTRN12607000228482)[3]

Participants (n=10) were randomised to received the study medication at either a 100mg (n=5) or 1000mg (n=5) dose. The primary outcome measurement was in vivo changes in lymphocyte subsets. The secondary outcome measures were ex vivo changes in T-lymphocyte (CD4 and CD8) activation, phagocytosis of granulocytes and monocytes, T helper 1/T helper 2 cytokines, and serum oxygen radical absorbance capacity.

The outcomes of the trial will be described and discussed. The Maritech® extract when taken orally over four weeks had an immune priming effect. It was demonstrated to be safe to use over the study period at the doses tested.

1. Fukuda S et al Eur J Clin Nutr. 2007 Jan;61(1):99-103.
2. Iso H et al Asian Pac J Cancer Prev. 2007;8 Suppl:35-80
3. Myers SP et al Biologics in press 2010

8 Nov
13.45 - 15.30
Room 219

Food Security and Sustainability (FS&S)

Prof Robert Kearney
Chair Person

8 Nov, FS&S
13.45 - 14.00
Room 219

Improving food security in developing countries by the introduction of sustainable fishing practices

Professor Steve Kennelly
Chief Scientist
Primary Industries, Industry and Investment NSW, Australia

This paper highlights the vital need for sustainable fishing practices in those countries where food security is a major, long-term problem. Using the term "vital" in this context is literal – the lack of sustainable fishing practices is costing lives in many parts of the world.

Recent data from FAO indicates that approx one-third of world fisheries production occurs in low-income, food-deficient countries - where seafood is a major source of protein. Unfortunately, however, many of the fishing methods used in such countries lack the improvements that have been implemented in developed countries which make fishing gears more selective. For example, the use of trawl nets in developing countries has, to a large extent, not incorporated the use of Bycatch Reduction Technologies that reduce the wastage associated with the capture and discard (or, in many cases, retention) of undersize fish. This leads to a sub-optimal use of the resource, with significant consequences for the population's food security.

Through case studies describing recent developments in Nigeria, Cameroon, Madagascar and the Gaza Strip, this talk will describe some of the complexities associated with the implementation of sustainable fishing practices in these countries – as compared to the simpler situation in developed countries. It illustrates that the critical need for food security in poor countries goes hand-in-hand with the need for sustainable fisheries management – but the implementation of the latter is extremely complex and always country-specific.

8 Nov, FS&S
14.00 - 14.20
Room 219

Sustainable use of marine resources-underutilized fish as a source of peptides modulating biomarkers of human health

Todor Vasiljevic
School of Biomedical and Health Science
Victoria University Australia

The world availability of fish has decreased in recent years with many commercially important marine fisheries already overfished. Not all marine captures obtained from the sea are adequately used for human consumption due to discards and fishery waste. Discarded by-catch comprises approximately 30 million tons of available resource not yet utilized. Thus effective utilization of these low value species should be given global attention. Most of the currently available underutilized fish species may be used for human consumption due to presence of highly nutritious fish muscle with varying levels of protein (13 to 21 g/100 g wet fish).

Endogenous fish proteases may hydrolyse myofibrillar proteins to release a range of potent biologically active peptides upon intestinal digestion with a range of physiological effects. Our on-going research demonstrated the release of the physiologically active peptides from three underutilized species upon hydrolysis by human digestive enzymes. It was also demonstrated that a number of effects including processing conditions and seasonal variations altered the peptide profiles and consequently bioactivity.

Our project aims to improve our understanding of the inherent properties of fish muscle from underutilized fish species in relation to the release and properties of peptides with important physiological activities to modulate selected biomarkers of the metabolic syndrome. Sixteen underutilized fish species are currently screened for high indigenous protease activities (calpain, cathepsins) and correlated to ACE and trypsin inhibitory activity, satiety-inducing properties, antioxidative properties and immunostimulating effects. This project will have significant implications for procedures used in the fish processing industry and for the health of fish consumers. It will improve our understanding of environmental conditions and processing regimens that regulate fish muscle protein conformation and proteolytic activity with respect to liberation of potential bioactive peptides.

8 Nov, FS&S
14.20 - 14.50
Room 219

Making use of abalone processing waste: opportunities for Nutraceuticals

Simone A. Osborne
CSIRO, Livestock Industries
St Lucia Australia

Abalone meat is abundant in vitamins and minerals and its consumption is historically linked to improved health and well being. However, little is known about other bioactive molecules present in the meat, or in abalone processing waste that may have potential health benefits. As a nutraceutical, abalone has attracted interest for the alleviation of

arthritic conditions and has been found to reduce the biomarkers associated with arthritis in vitro. Abalone extract packaged as capsules claims benefits of promoting healthy eyes, alleviating colds, Crohns disease, fluid retention and oedema, and improving circulation. Abalone is also blended with shark cartilage and New Zealand green lipped mussel which formulates the veterinary nutraceutical, “Sasha’s Blend”. This product claims to be an anti-inflammatory that improves joint health by promoting the growth of healthy cartilage. To date, published scientific investigations have reported the anti-inflammatory effect of abalone powder, the antioxidant potential of extracts from abalone internal organs, and a patented use of abalone processing waste identifying it as a source of natural protein products. Taken together, reported health benefits suggest that abalone and abalone processing waste, will provide a source of anti-inflammatory, anti-arthritic, and antioxidant molecules.

Wild caught Australian abalone supplies almost 40% of the world abalone market. Preparation of abalone for sale generates large quantities of waste as only one third of abalone is edible meat, with the remaining two thirds comprised of shell and offal, which is almost always discarded. As abalone is sold mostly in a processed form, substantial quantities of cooking juice are also discarded. Thus, there are 1000’s of tonnes of abalone shell and offal, and vast quantities of cooking juice, disposed of every year that could be used for other purposes.

In this study samples were prepared from wild-caught Tasmanian abalone processing waste, that included gut material and waste from various processing washes. The samples were prepared using a variety of methods involving homogenisation and protease digestion, filtration, and anion/cation exchange chromatography. Protein content was determined in each sample revealing substantial mg/ml concentrations of total protein in some of the waste material. Investigations into the biological activity of the samples revealed significant anti-inflammatory activity in some of the samples that was comparable to the positive control. These results indicate that abalone processing waste provides a source of anti-inflammatory molecules that may have therapeutic applications as nutraceuticals. This investigation potentially identifies a use for - and possibly a lucrative income from - the 1000’s of tonnes of abalone waste generated every year.

8 Nov, FS&S
14.50 - 15.10
Room 219

Development of bioplastics from shellfish waste and their degradation in natural environments

Suchetana T. Chattopadhyay
Faculty of Life and Social Sciences
Swinburne University of Technology, Australia

In Australia, the waste from households and businesses disposed into municipal landfill sites is comprised of 25% packaging waste. Biodegradable packaging partly resolves the issue of the huge amount of plastics going to landfill. The biodegradable polymers currently used (starch-based, including PHA and PLA) use corn as their primary feedstock and hence compete with food production. A feasible solution is using natural polymers like chitin (waste product of seafood industry) in combination with other polymers to produce “bioplastics”.

Recently, chitin derivatives, such as chitosan, have become more widely used in a number of industries. These are especially useful as chelating and flocculating agents for wastewater treatment, animal feed additives, wound dressings, cosmetics, fungicides, packaging materials and biosorbents. Commercial interest has been generated in these polymers because of their high degree of biodegradability, biocompatibility and non-toxicity.

Proprietary blends of up to 40% organic materials including chitin and other biopolymers were prepared by MM Foods Pty Ltd, Bayswater, Victoria, and their capability to degrade in compost has been tested according to AS ISO 14855-2005. Preliminary results indicated that biodegradability rates were 21.8+5% in 170 days in the case of chitin blended with polyesters. The composted materials were characterized by scanning electron microscopy which showed evidence of microbially-induced biodegradation.

This study has shown that chitin-containing polymer blends are biodegradable and may be useful in the manufacture of environmentally-friendly “bioplastics”.

8 Nov
13.45 - 15.30
Room 216

Human Behaviour and Communications (HB&C)

Dr Nicholas Ralston
Chair Person

8 Nov, HB&C
13.45 - 14.00
Room 216

Tuna meltdown: How green groups and the federal government put America’s poorest children at risk

David M. Martosko
The Center for Consumer Freedom
Washington DC, USA

Consumer purchasing data from ACNielsen (“Homescan®”) indicate that nearly 4.4 million U.S. households earning less than $30,000 per year completely eliminated their purchases of canned tuna between 2000 and 2006. This seven-year period corresponded with the U.S. government’s issuance of seafood consumption advisories related to methylmercury exposure, and with a number of NGO campaigns that raised alarms about methylmercury in seafood without providing meaningful context. The medical literature contains zero reported cases of fetal mercury toxicity in the United States. We sought to determine if there was a negative public-health impact of these decisions by millions of Americans living near or below the poverty line.

Extrapolating from U.S. Census data and other government reports, we estimate that 256,670 children were born into low-income households that purchased no canned tuna (which was the only practically affordable source of omega-3s). We provide a reasonable expectation of the health harms among these U.S. children, resulting from the anti-tuna panic that developed during the first years of the current millennium.

It appears that the U.S. federal government and numerous environmental advocacy NGOs have put the health of countless children in low-income households at risk. A significant education campaign is needed to reassure economically disadvantaged American women that fish (meaning canned tuna, practically speaking) is a safe food for expectant mothers to consume moderately as part of a balanced diet.

8 Nov, HB&C
14.00 - 14.20
Room 216

Current trends for glucosamine and omega-3 functional food ingredients

Prof Colin Barrow
Deakin University
Geelong, Australia

Glucosamine is primarily consumed as a nutritional supplement for the prevention or treatment of osteoarthritis, which affects about 21 million Americans. Although the clinical evidence to support the efficacy of glucosamine is not conclusive, it is very strong. The two largest clinical trials on glucosamine are the NIH-sponsored GAIT study (1) and the GUIDE trial (2), both showing some positive benefit for glucosamine for osteoarthritis. Strong clinical support and consumer awareness has enabled glucosamine to become an established nutritional supplement ingredient with about 10 percent worldwide growth rate from 2003 to 2008. Sales in the USA alone were $872M in 2008 and about $2B globally. Glucosamine has had less success as a functional food ingredient although there have been recent technological advances in the production and formulation of this ingredient for functional foods and beverages recently. These advances will be summarised and discussed in this presentation.

The health benefits of the long-chain (LC) omega-3 fatty acids eicosapentanoic acid (EPA) and docosahexanoic acid (DHA) are established and have been the subject of numerous reviews (3-6). Although the clinical evidence is strongest for cardiovascular benefit LC omega-3s have a variety of health benefits and are considered wellness products, leading to relatively good success in functional foods. Approximately 300 new LC omega-3 fortified food products were introduced worldwide in 2006, 400 in 2007 and 700 in 2008, with global retail sales of these fortified foods expected to grow from about $5B in 2008 to $8B in 2012 (7). Major brands such as Minute Maid, from Coca Cola, and Tropicana, from Pepsi, have launched LC omega-3 fortified products. In addition to the functional food market, adding DHA to infant formulae has become the industry standard, with DHA fortified formulas representing about 70% of the total $9B global infant formula market. The nutritional supplement market for LC omega-3 also remains strong, with the majority of product in this segment being derived from fish. With the expansion of the omega-3 food market large companies such as BASF, DuPont and Monsanto are entering the market with novel production technologies that compete with fish derived omega-3. Also, a variety of omega-3 stabilisation and microencapsulation technologies are entering the market expanding the variety of foods able to be fortified with omega-3 fatty acids. Some of the current trends in omega-3 production technologies and microencapsulation technologies will be reviewed in this presentation.

8 Nov, HB&C
14.20 - 14.50
Room 216

Eating Fish for Two

Prof Sean Strain
Human Nutrition
University of Ulster, Northern Ireland

After graduating with a BSc (Chemistry), BAgr (Agricultural Chemistry) and PhD (Nutritional Biochemistry), all from Queen’s University, Belfast, he spent several years (1977-1980) in academia in Australia before joining his current institution in 1981. He was instrumental in creating the highly successful BSc Honours Human Nutrition and Dietetics and building up human nutrition research at the university to its current position. He is Professor of Human Nutrition (since 1994) and Director of the Northern Ireland Centre for Food & Health (NICHE). He was part of the submission in Biomedical Sciences that was top rated (5* for research excellence) in the two previous (1996, 2001), and top-rated on research power in the most recent (2008), UK - wide Research Assessment Exercises. He has attracted over £33M in research grants and research structural monies and is an author of over 200 peer-reviewed research publications, mainly in the areas of trace element nutrition, fatty acid metabolism, and in B vitamin and homocysteine metabolism. He is currently working on two large projects, one funded by the EU and the other by the NIH (US), which are investigating the effects of maternal status of omega-3 fatty acids and foetal exposure to methylmercury on cognitive development outcomes in mother-child cohorts in the Seychelles. In 2002, he was elected a member of the Royal Irish Academy. He is currently President of the Nutrition Society and a member of various national and international committees including: Member, Panel on Dietetic Products, Nutrition and Allergies, and

Chairman, Working Group on Claims, European Food Safety Authority (EFSA) Parma; President of the Board of the European Nutrition Leadership Programme.

8 Nov, HB&C
14.50 - 15.10
Room 216

The role of seafood in promoting health and preventing disease – a review of the evidence

Amanda Johnson
Reg Nutritionist
Wellington, New Zealand

Kai moana, or food of the sea, includes fin fish, shell fish (molluscs and crustaceans), kina (sea eggs) and seaweed. This review of the latest evidence on the role of seafood in promoting optimal health and preventing disease will focus primarily on the role of fin fish and shell fish in a healthy diet.

Humans have been eating seafood since the beginning of recorded history; ancient Egyptians fished both the River Nile and the Mediterranean Sea, and the ancient Greeks used fish and shellfish extensively. More recently, there is increasing evidence for a beneficial role for fish in a number of different diseases. Fish is a rich source of the very long chain omega-3 polyunsaturated fatty acids (LCn-3PUFA) docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA), which have been linked to health benefits, particularly in relation to the prevention of cardiovascular disease. The protein in fish may also be helpful in promoting satiety in people on weight-reducing diets. Further, LCn-3PUFA may be helpful for people with diabetes and may be protective against cancer, although there is a need for more research in these areas. The anti-inflammatory effects of LCn-3PUFA have also been investigated, and fish and/or LCn-3PUFA supplementation may play a beneficial role in some inflammatory conditions, e.g. rheumatoid arthritis.

In addition, research seems to indicate that including relatively high intakes of LCn-3PUFA in the diets of pregnant women may be associated with beneficial developmental effects among their babies. There is also some evidence of a positive effect of LCn-3PUFA on learning and behaviour in children. And there is a growing body of evidence to suggest that LCn-3PUFA might be important for the maintenance of good cognitive function later in life; as such, it has been suggested that older people may benefit from consuming oily fish.

Fish and shellfish are a good source of high biological value protein and are low in fat and saturated fatty acids. Key micronutrients in fish include iron, zinc, iodine and selenium. Fish eaten with bones, such as salmon and sardines, are a source of calcium. Fish also contains B vitamins, and oily fish and the liver of white fish are a source of the fat-soluble vitamins A and D.

There are limited data on intakes of LCn-3PUFA; however, intakes are thought to be modest. Given the evidence for beneficial effects on health, it has been suggested that it would be prudent to increase intakes in Australia and New Zealand to 610mg/day for men and 430mg/day for women (NHMRC, 2006).

Although many of the health benefits LCn-3PUFA require further research before firm recommendations can be made, there is a large body of evidence to suggest that it is highly beneficial to include fish in the diet on a regular basis as part of a healthy, balanced eating regimen. Its consumption should be strongly encouraged.

8 Nov, HB&C
15.10 - 15.30
Room 216

Let them eat fish: an economic evaluation of the direct healthcare cost savings resulting from adequate dietary intake of seafood in the prevention of coronary heart disease in Australia

Lea Starck
Deakin University
Geelong, Australia

Cardiovascular disease (CVD) places the largest economic burden of any disease on the Australian health care system, with coronary heart disease (CHD) representing the largest proportion of CVD and accounting for the highest mortality of any disease in Australia.

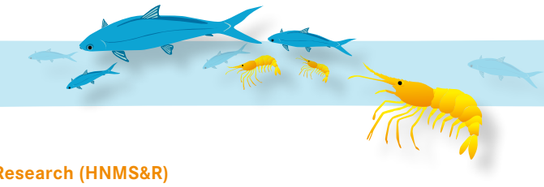
Following on from other economic appraisals of healthcare cost savings resulting from lifestyle interventions to prevent CHD in Australia, this study evaluates the direct health care expenditure savings that result from consumption of 2 or more servings of fish as an intervention to prevent coronary heart disease (CHD) in Australia in the fish consuming population.

Available meta-analyses were used to quantify the efficacy of fish consumption as an intervention for CHD and then applied to a Population Attributable Fraction (PAF) Model to cost the resultant savings in direct health expenditure for this disease. Using this method, it was calculated that the net healthcare savings from existing adequate fish consumption of two or more servings per week in the adult population is estimated at AUD $238.35 million per annum. Given that only a relatively small percentage of the adult population in Australia consume the desired amount of fish per week, it is therefore expected that increasing fish consumption in the adult population of Australia would result in substantial savings in health care expenditure on CHD.

On this basis, a projection that an additional thirty percent of adults who report eating at least one serve of seafood per week increased that consumption to two or more serves, estimates a direct health care cost net saving of AUD $641.01 million.

Statistics from Japan, with a very high population consumption of seafood and a CHD mortality rate less than a quarter that of Australia's, would support an estimated reduction in CHD mortality, and the resultant savings in direct health expenditure.

Monday 8th November 2010 – Afternoon Sessions



8 Nov
15.45 - 17.30
Room 212 & 213

Health, Nutrition and Medical Science & Research (HNMS&R)

Prof Les Cleland
Chair Person

8 Nov, HNMS&R
15.45 - 16.05
Room 212 & 213

Dealing with Oxidised Fats

Prof Trevor Mori
Research Professor – University of West Australia
School of Medicine and Pharmacology Royal Perth Hospital Unit

Dr Trevor Mori is a senior lecturer/NH&MRC Senior Research Fellow and a biomedical research scientist within the School of Medicine and Pharmacology, Royal Perth Hospital Unit at the University of Western Australia. Trevor's interests are the effect of diet and lifestyle on cardiovascular risk factors, including aspects of diabetes, hypertension and atherosclerosis. Trevor's research has focussed on the potential beneficial effects of omega-3 fatty acids in relation to cardiovascular disease and the role of lipid oxidation in cardiovascular disease.

Amongst many other things Trevor is the Secretary to the Australian Atherosclerosis Society and has prolific publication portfolio and has done extensive work with the National Heart Foundation.

8 Nov, HNMS&R
16.05 - 16.20
Room 212 & 213

The effects of fish oil supplementation on cognitive performance and cardiovascular health in healthy young adults

Isabelle Baur
Brain Sciences Institute,
Swinburne University of Technology, Australia

Background: Seafood, fatty fish such as tuna, mackerel, sardines, herrings, and nuts constitute the main source of omega-3 polyunsaturated fatty acids (n3-FA). Previous studies have shown the beneficial effects of n3-FA on cardiovascular functioning. However, the effects of fatty acids on cognition are still controversial.

Aim: Investigate the effects of a docosahexaenoic (DHA) n-3-FA-rich and eicosapentaenoic (EPA) n-3-FA-rich fish oil supplementation on cognition and cardiovascular measures in healthy subjects.

Design: A crossover, randomized design was utilized. Twenty-three healthy participants (23 females, 11 males) aged 18-34 took 6 capsules of an EPA-rich (558mg EPA/138mg DHA per capsule) and a DHA-rich (414mg DHA, 156mg EPA per capsule) supplementation for 30 days. Participants were tested prior and following each supplementation period. Measures include fatty acid blood tests, cardiovascular and cognitive measures.

Peripheral and central blood pressure decreased following omega-3 fatty supplementation (N=7). Measure of complex processing speed (CPS), simple memory (SM) and spatial working memory (SWM) improved after a 30-day n3-FA supplementation period. EPA decreased CPS and DHA increased % of correct responses in a SM task.

Conclusions:

- Increasing n3-FA daily intake by 3 to 4 g for 30 days improves cognition and cardiovascular health in healthy young subjects.
- n3-FAs promote health: increased n3 FA intake reduces n6-FA levels in plasma phospholipids. High levels of N6-FA levels are associated to inflammatory and chronic diseases.

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Fish and omega-three intakes and information needs of a cohort at increased risk of colorectal cancer

Prof Lynne Cobiac
Nutrition and Dietetics, Flinders University, Australia

This cross-sectional study investigated whether i) red meat, fish and long chain omega-3 PUFA intakes, ii) awareness of the diet-CRC link, and iii) dietary modifications and perceived information needs differed, according to three categories of neoplastic history in a clinically well-defined sample (n=190) of South Australian adults at increased risk of CRC. A validated food frequency questionnaire was used to determine the usual intakes of those with (1) a personal history of CRC (n=52), (2) a personal history of adenoma (n=55) and (3) neoplasia-free individuals with a family history of CRC (n=83). Additional questionnaires were administered regarding dietary modifications, awareness of the diet-CRC link and perceived nutrition-related information needs. Sixty-seven percent of participants met fish intake recommendations for cancer prevention and 43% met red meat recommendations. No participants met n-3 PUFA recommendations through diet alone, suggesting that the fish consumed was not high in omega-3. Overall, 90% of participants wanted information on the diet-CRC link and 66% reported modifying their diet to avoid CRC. Less that 1% reported any awareness of a link between fish intake and risk of CRC and <2% had changed their fish or omega-3 supplement intake. There were no differences in intakes and information needs according to neoplastic history. Participants with a family history of CRC reported greater awareness of the diet-CRC link than those with history of adenomas (60% vs. 35%, P=0.015). These findings suggest there is a need for information dissemination in this higher risk population, to guide them in making appropriate dietary modifications.

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Fish intake in elderly Australians at risk of cardiovascular disease

Dr Alice Owen
Monash Centre of Cardiovascular Research and Education in Therapeutics
Monash University, Australia

Consistent with international guidelines for maintenance of cardiovascular health, the National Heart Foundation of Australia recommend consumption of 500mg marine-derived omega-3 fatty acids (EPA+DHA)/day for adults and 1000mg EPA+DHA/day for those with heart disease. The present study examined current fish intake in a group of older Australians aged 75y+ with a history of hypertension, a population group at high risk of cardiovascular disease (CVD). The study collected self-reported fish and fish oil intake, and general practitioner-reported risk factors and history of CVD.

The participant group (n=1192) had a mean age of 84 ± 4 y (Mean±SD), and female to male ratio of 50.2%:49.8%. On average, the females in this sample were slightly younger than the males (mean age= 83.7y vs 84.4y for women vs men respectively, p<0.005). Women were significantly more likely to be reporting intake consistent with meeting very long chain omega-3 targets than were men (F:M, 62%:52%, p=0.001), and were more likely to take fish oil supplements (F:M 36.6% :27.1%, p<0.001). Those with a history of any CVD, diabetes, or specific CVD events such as arrhythmia or myocardial infarction were no more likely to be meeting 'healthy adult' targets for omega-3 intake or to be taking fish oil supplements than those without. The proportion of those in this population sample with a history of CVD estimated to be meeting the higher omega-3 intake levels recommended for those with heart disease was less than 30%.

Large-scale secondary prevention studies such as GISSI-P and GISSI-HF suggest that omega-3 supplementation has the ability to reduce cardiovascular mortality by 15%, compared to risk reduction of 30% for low-dose aspirin, widely promoted for secondary prevention of CVD. In the present study, the use of fish oil capsules by those with CVD was about half that of those reporting aspirin use -which was itself only used by a little more than half of all those with a history of CVD. This study raises the question as to whether the public health messages about the cardiovascular health benefits of very long-chain omega-3 supplementation reaching high-risk population groups, such as the elderly.

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Fish and seafood intake in women of child-bearing age, analysis of the 1995 National Nutrition Survey

Lily Chan
Nutrition and Dietetics
Flinders University, Australia

Higher maternal fish intake during pregnancy is associated with better childhood developmental outcomes, longer gestation, higher birth weight and improved maternal and adult outcomes such as improved mental health, reduction of cardiovascular risk factors and inflammation.

The longer n-3 fatty acid, docosahexanoic acid (DHA), in particular appears essential for neurocognitive development for the developing foetus. In the latest recommendation from Food Standard Australia New Zealand, women planning to get pregnant are encouraged to consume two to three serves of low-mercury content fish per week. However, data from the 1995 National Nutrition Survey suggested that only one third of women aged 18 to 49 years consumed fish and seafood two or more times a week on average. On the day of the survey, 18% of women aged 18 to 49 years consumed any fish or seafood products. After 'fish, not further specified', tuna and prawn (both 19% of fish and seafood consumers) were the most commonly consumed products; whereas the more oily, salmon, was consumed by only 11% on the day. In the same survey, it was estimated that the mean daily intake of DHA in Australian adult women was 83mg; a daily intake of at least 200mg DHA has been recommended during pregnancy and lactation. The low intakes of fish/seafood among women urges the need for dietary interventions to increase intake; thus optimising maternal and fetal health outcomes.

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Using nutritional modeling to develop cancer prevention diets for high risk groups

A/Prof Alexandra McManus
Centre of Excellence for Science, Seafood and Health
Curtin University, Australia

A healthy balanced diet including seafood and regular physical activity can help to prevent some cancers including: prostate, colorectal and lung cancers. Food groups from the Australian Guide to Healthy Eating (AGHE) were chosen to model the 14 day menu cycle for people at high risk of developing nutrition-related cancers. 456 commonly consumed foods were chosen from several validated databases and their energy and nutrient content was extracted using the Food Works program. Simulation tests were then conducted to test optimal models using iterations of foods. Based on a 14 day menu (varying in the number of serves for each food group/day), the simulator process ran varying combinations 1000 times (for example, 1000 combinations of 5 items of breads and cereals from the 46-item category) to get a 14 day, mean energy and nutrient intake. Using this mean intake, it is possible to calculate the likelihood (%) that an individual would meet nutrient recommendations.

Our results indicate that including a high seafood diet into a diet based on the core food groups and that also meets nutrient intake recommendations, is achievable. Consuming fish 5-7 times per fortnight is therefore an appropriate way for target populations to meet fatty acid recommendations, as well as achieving core food group servings, without compensating nutrient intake or compromising energy intake.

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Room 219

Food Security and Sustainability (FS&S)

Prathapachandra Shetty
Chair Person

8 Nov, FS&S
15.45 - 16.05
Room 219

Where will all the seafood come from?

Steve Nel
Western Australian Department of Fisheries
Perth Australia

When the global population reaches 8.3 billion in 2030, to meet demand, an additional 30 million tonnes of seafood will have to be produced each year. That demand can only be supplied by aquaculture.

The sector most likely to supply the demand is marine finfish aquaculture. This sector has experienced rapid production growth, which up to now has taken place almost exclusively in sheltered waters close to shore. Generally, these sheltered, near shore areas are now fully exploited, offer little or no room for future expansion and can have disease and pollution problems; they are also subject to competing resource use. As a result, the recent growth rate of the sector has slowed as near shore sites reach capacity. The current trend suggests future marine aquaculture growth will only meet projected demand if production extends into less sheltered oceanic areas.

Future growth in aquaculture and seafood production will take place offshore, in the open ocean. This so-called open ocean aquaculture ("OOA") sector, producing marine fish in exposed, high-energy ocean environments, represents the next frontier in seafood production. It can meet a large proportion of the projected world demand and has the greatest capacity for growth.

The challenges to OOA development include designing and building facilities that can withstand exposed offshore conditions; choosing appropriate species and culture technologies; obtaining sufficient investment; providing a supportive legislative and regulatory environment; addressing potential environmental impacts; and remaining internationally competitive.

The higher capital and operational costs of offshore production systems are offset by their competitive advantages. These include excellent water quality; a better culture environment for the fish, providing a superior-quality product and improved fish welfare; greater carrying and assimilative capacities; a less energetic environment; less bio-fouling at greater depths; substantial protection from storms; comparatively little wear on components; lower adverse environmental effects; fewer user conflict further away from shore; lower visual impacts; improved security and lower risk for the culturist.

The technology needed for OOA is now advancing rapidly as governments and industry, realising the opportunity afforded by offshore aquaculture, are investing heavily in its development. Commercial and research offshore operations are now operational in countries that include Norway, Chile, China, Ireland, Spain, Italy, Korea, USA and Japan. Not yet established in Australia, OOA offers considerable opportunity for development and expansion of this country's marine finfish sector and its prospects for achieving sustainable food security.

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Whence the omega threes? Should we be looking further down the food chain?

Dr Tom Lewis
Rural Development Services
Hobart, Tasmania

There are myriad studies attesting to the health benefits to be gained through eating more omega-3 fatty acids - especially the long chain, omega-3 polyunsaturated fatty acids (n-3 PUFA).

Eicosapentaenoic acid [EPA; 20:5(n-3)] and docosahexaenoic acid [DHA; 22:6(n-3)] are two n-3 PUFA currently receiving much attention and already have been termed “essential” fatty acids. The n-3 PUFA are known to decrease the incidence of coronary heart disease, stroke and rheumatoid arthritis. DHA is essential for normal development of neural tissue in infants, especially in the eyes and brain. The possible role of these n-3 PUFA against other disorders (e.g. asthma, dyslexia, depression, some forms of cancer) is also becoming increasingly recognised, although further research is required.

As the importance of the presence and proportions of various PUFA in the diet of both man and beast becomes better understood, the value of these nutrients to a range of industries also increases.

But where do the omega-3 PUFA come from? What makes them and where are they made?

Seafood is widely recognised as an important source of n-3 PUFA in our diets. The relatively high PUFA content of many seafood species is a compelling argument for eating seafood. If we want to increase the omega-3 intake of the global population, do we need to eat more seafood, or are there other, more efficient sources?

This paper will tell a story of the thraustochytrids - common marine microheterotrophs taxonomically aligned with some microalgae - and will suggest that we may be well advised to increase our efforts in mass producing these organisms if we really want to be able to feed omega-3s to the world.

Many studies have shown that some thraustochytrid strains can be cultured to produce high biomass, containing substantial amounts of polyunsaturated fatty acid (PUFA)-rich lipid. It is also evident that the amount and type of PUFA produced by some thraustochytrid strains can be varied by manipulation of physical and/or chemical culture parameters.

At present, fish oils and cultured phototrophic microalgae are the main commercial sources of PUFA. The increasing value of seafood and the relatively complex technology required to produce microalgae commercially have prompted research into potential alternative sources of PUFA. The culture of thraustochytrids and other PUFA-producing microheterotrophs is seen as one such alternative. Indeed, several thraustochytrid-based products are already on the market, and research into additional applications is continuing.

As more is learned about the health and nutritional benefits of PUFA, demand for PUFA-rich products is expected to increase. Results to date suggest that commercial thraustochytrid culture could form an important part in the supply of such products.

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Bioactive ingredients of Victorian Seafood: a scoping study

Simone Rochfort
Biosciences Research Division
Department of Primary Industries, Bundoora, Australia

The Aquaculture Futures Initiative (AFI) (2008-2012), part of the Victorian governments Future Farming Strategy, integrates innovative research, market and value chain development, and investment attraction to facilitate the transformation of the aquaculture and seafood industry in Victoria into a globally competitive sector. Here we report the results of a scoping study into potential bioactive ingredients in blue mussels and Murray cod. Accurate information regarding identification of natural compounds and their bioactivity will assist with meeting new and developing market requirements.

Samples of farmed blue mussels from Port Phillip Bay and cage-farmed Murray cod fed different diets are being characterised using methods including metabolomics analysis by nuclear magnetic resonance (NMR), gas chromatography mass spectrometry (GCMS) and liquid chromatography mass spectrometry (LCMS) for analysis of metabolite and peptide fractions. Potential bioactive fractions are being screened for antimicrobial and inflammatory activity using in vitro cell assays.

1D NMR analysis of Port Phillip Bay blue mussels followed by chemometric modelling showed clear metabolic differences that could discriminate between mussels from two distinct sites. Aqueous extracts from mussels at both sites showed high levels of anti-inflammatory activity using cell bioactivity assays. Further analysis of mussel lipid and aqueous fractions is being undertaken by GCMS and LCMS to identify potential bioactives.

This project represents a strategic approach to developing new capabilities and partnerships to support seafood bioactives research and development in Victoria. The initial scoping study provides a starting point for detecting and exploiting new products and ingredients to add-value to existing seafood commodities and delivery of health benefits to consumers.

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Seaweed and Health: Nature versus nurture in determining the health benefits of Seaweed

Pia Winberg
Shoalhaven Marine & Freshwater Centre
University of Wollongong, Australia

There is a growing body of scientific research that underpins potential health claims associated with the consumption of seaweeds or macroalgae. A review of studies on 8 genera of seaweeds found some support for structure function claims relating to the nutritional content of protein, dietary fibre, vitamins, minerals and poly-unsaturated fatty acids. Initial evidence for potential higher level health claims related to cholesterol reduction, glucosidase inhibition, effects on immunomodulation, and viral, bacterial, apoptotic, and oxidative activity. There is also early research on anti-inflammatory and anti-hypertensive properties. Considering the breadth of seaweed diversity beyond these eight genera, the potential for an increased role of seaweeds as a functional food or as a nutraceutical and pharmaceutical is large.

Despite this opportunity and the fact that seaweed aquaculture production exceeds most other marine aquaculture in terms of biomass produced, there are major gaps in the research evidence base substantiating the benefits of individual seaweed products. Reasons for this are many but include reliability and variability of measured indices for wild types of seaweed species and a lack of knowledge about seaweed species, identification and genetic variation.

These issues require a multitude of approaches from further basic research on the taxonomy and phylogenetics of seaweeds, to clinical trials for specific health applications. A strategic approach to address these issues is required and has gained momentum in Australia through the formation of Seaweeds Australia. With changes to food related health claim regulations and market expectations of new nutraceutical and pharmaceutical actives, there is a substantial requirement for demonstrated health benefit. In addition, this activity must be consistent within and between batches of the product. In order to achieve this, we need to determine to what extent the active property is due to environmental conditioning (for example the nutritional profile of the water source for cultivation of harvesting area) or genetics. Here we present a case study of the effect of environmental conditioning on the nutrient profiles of protein and carotenoids (Fig. 1), and begin to characterise genetic variation, in order to gain a better understanding and control of factors affecting the nutrient content of seaweeds.

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Enhancing food security through good fisheries management - a new strategy for the UN FAO?

Grant Leeworthy
Director, Fishermen Direct and research Manager,
Tasmanian Seafoods P/L and Deakin University, Australia

Grant is a young, ambitious and exciting character heavily into everything ‘seafood’ and manages to combine a hectic family life with a heavy social life and heaps of business travel and work. He is passionate and knowledgeable and simply a mad keen genuine lover of our Oceans – he would rather be out diving or fishing than at a Conference but he has something important he wishes to present.

As wild fisheries production has stagnated world wide, it has been assumed that nothing can be done to improve productivity and therefore food security through this sector. This talk challenges this assumption to suggest that there are several key strategies that the UNFAO can use to encourage improvements to wild fisheries based food security.

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Room 219

The politics of tuna and whaling between Australia and Japan

Dr Kate Barclay
MA (ANU), PhD (UTS)
Senior Lecturer, Social and Political Change Group, University of Technology, Sydney

Kate Barclay is one of the few social scientists in Australia researching tuna fisheries in the Asia Pacific region. In 2009 she coordinated a workshop called Green Tuna: Market-Based and Government-Based Measures for Improving Sustainability in Tuna Industries. In recent years she has attracted funding from AusAid, the National Library and the ARC to conduct research that includes Taiwan and China tuna fisheries and Japanese fisheries governance. Other projects have included fisheries trade-related development in Solomon Islands for the United Nations Development Agency and global trade in tuna products from the south west Pacific for TRAFFIC Oceania. Kate is published in top international journals in her the fields of fisheries social science and Asian studies.

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Room 216

Human Behaviour and Communications (HB&C) – Understanding the seafood consumer (Chair: A/Prof Meredith Lawley)

Workshop 1
Understanding what consumers' value is the fundamental building block for successful marketing strategies. Without this knowledge, the development of effective marketing strategies based on compelling customer value proposi tions does not occur. Hence, the purpose of this workshop is to draw from the considerable consumer research that has recently been conducted by the Australian Seafood CRC on seafood consumption patterns and behaviour to develop a basic understanding of consumer decision making processes for seafood and major influences on seafood consumption including key drivers and barriers.

Presenters
Dr Meredith Lawley is an Associate Professor (Marketing) within the Faculty of Business at the University of the Sunshine Coast with her main teaching responsibilities being in research methods and marketing management. Meredith's key research interests are in international education and the marketing of seafood.

Dr Dawn Birch is a Senior Lecturer in Marketing at the University of the Sunshine Coast, Queensland, Australia. Dawn teaches courses in marketing at the undergraduate, post-graduate levels and has published in both marketing and education journals. Her current research interests include seafood consumption, food involvement and food-related lifestyles, marketing education, e-learning formats, and multimodal delivery.

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Room 212 & 213

International Seafood And Health Conference Public Forum

Facititated by Jon Faine
Once in a lifetime opportunity come and hear from six International Experts discussing Human Health and Nutrition issues. The Public Forum will be facititated by Jon Faine. Known for provocative and probing debate, quick wit and willingness to ask the stickiest of questions, Jon Faine delivers one of the most thought-provoking radio programs in Australia.

The audience will gain important information that could be life changing!
With chronic diseases at an all time high, and mental illness in particular increasing at a rapid rate, it behoves us all to get the latest information on the best ways to avoid these issues.

With the hospital system under crisis, chronic diseases at an all time high and mental illness increasing at a rapid

Tuesday 9th November 2010

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10.30 - 12.45
Room 212 & 213

Mercury (Chair: David Martosko)

Workshop 2
Mercury is a long time barrier to seafood consumption and it will be discussed in depth by experts in the field with the aim of bringing some common sense solutions to the issue with the aid of delegates' involvement.
There are well documented industrial accidents which have created human disasters and there are agreed pre-cautionary principles involved in advice given to certain 'at risk' groups but has this advice gone too far and has it actually done more harm than good?

Presenters
David Martosko is the Research Director for the Center for Consumer Freedom and has, over the years, been a strong voice in advocating getting the facts on the table. He has been involved in developing MercuryFacts.com and FishScam.com and he will Chair this workshop.

Professor Steve Otwell, a Director of IAFI and based at University of Florida's Food Science and Human Nutrition Department will help set the scene with some of the history and issues involved.

Papers will be presented by **Dr Iqbal Ahmed** from Animal Physiology Ecotoxicology Sector, Department of Biology, University of Aveiro and **Professor Tore Syversen** from Department of Neuroscience, Norwegian University of Science and Technology.

Bringing in an important dimensions to the equation will be world renowned expert on selenium, **Dr Nicholas Ralston** (University of North Dakota), and **Sean Strain**, Professor of Human Nutrition at University of Ulster, who has been investigating the effects of maternal status of omega-3 fatty acids and foetal exposure to methylmercury on cognitive development outcomes in mother-child cohorts in the Seychelles for more years than he would care to remember.

9 Nov
10.30 - 12.45
Room 219

Seafood Issues – food safety, allergies, etc (Chair: Jayne Gallagher)

Workshop 3
Food safety – perceptions are still hanging around.
Despite the many steps forward that have been made in food safety it is still high on the agenda when you dealing internationally. The industry has had to deal with the 'dodgy prawn' insurance campaign and the rise in 'allergies' to seafood has been steep. This workshop aims to talk through some of the issues and address the perceptions.

Presenters:
Barbara Montwill works within the Center for Food Safety and Applied Nutrition at the US Food and Drug Administration. She has considerable expertise in the sustainable development of competitive marine aquaculture in the United States and is interested in the production of health and nutritious foods through aquaculture. Antibiotics will be the main topic of the presentation.

Dr Wendy Newton is Senior Food Microbiologist with the Centre of Excellence for Science Seafood & Health, a national centre housed within Curtin University. Dr Newton has skills and knowledge across a wide range of food based industries. Food microbiology featured prominently in her work history, both in the management of a working food and environmental laboratory and demonstration of food microbiology at both undergraduate and postgraduate levels. The topic of Dr Newton's PhD was an investigation into the food processing potential of novel waxy wheat based on the unique characteristics of waxy starch. How well is seafood travelling in this area.

Shan Shan Sun is associated with the Marine Biomedical Sciences and Health Research unit at RMIT University. Her research includes investigating food allergy mechanism to establish new immunotherapeutic strategies for allergic diseases to inform the development of guidelines for effective patient management from a clinical point of view. Ms Sun is currently completing a doctorate entitled ' Evaluation of allergenicity using Rat Basophilic Leukemia (RBL), Epithelium cell lines and Human Basophil cells'.

Dr Toshikazu Komoda from the School of Food, Agriculture and Environmental Sciences, Miyagi University Japan, is currently completing a Post Doctoral Fellowship with RMIT University. His areas of expertise relate to food and nutritional sciences. Dr Komoda's Post Doctoral research project is entitled 'Detection and identification of novel allergens in Australian prawns'.

Shruti Sapatarshi's areas of expertise include biotechnology and microbiology. Her currently research relates to occupational sensitisation to allergens within the workplace. She is also interested in detecting and investigating allergens in Australian fish.

Jayne Gallagher is the Australian Seafood Cooperative Research Centre's Programs Manager for Research Program 2 (Product and Market Development).
For nearly 20 years, Jayne worked for the Australian Government in Foreign Affairs and Trade and Agricultural portfolios. In this role, she was involved in the Asia-Pacific Economic Forum Fisheries Working Group and other international consultative forums. She was the first Australian Government Director of Aquaculture and was responsible for facilitating seafood industry development. Jayne was seconded from her role as the Business Development Manager for Seafood Services Australia Ltd to take up the CRC role. Jayne has been responsible for the development and introduction of the highly successful SeaQual program and other initiatives to help industry understand and meet regulatory and customers expectations for food safety and quality.
Jayne has been President of IAFI - the International Association of Seafood Professionals 2005-2009 and remains a Director on the Board.. With a Science Degree with a Psychology major and special interest in developing industry driven commercially viable and sustainable change programs Jayne has added to her portfolio by recently gaining her MBA.

Sandip Kamath – is a student at RMIT University in Melbourne and is studying under Associate Professor Andreas Lopata, a renowned expert on allergies particularly as they relate to seafood. Sandip also played a special role with our Conference in that he assisted with the creation of data bases and other administrative work.

9 Nov
13.45 - 15.30
Room 212 & 213

Consumer perceptions: Health Claims, food regulations, new technologies and barriers to consumption (Chair Dr Trevor Webb)

Workshop 4
Consumers are becoming increasingly interested in food production and the real or perceived risks associated with consumption of food. The recent discussions regarding the US FDA considering a genetically improved Atlantic Salmon and how this was handled by the media is a great example of this issue.
The purpose of this workshop is to discuss consumer perception and attitudes to food in general using seafood as a common context for discussion. Presentations will be varied but will highlight some of the concerns of consumers around the food readily available to the general public.

Presenters:
Hazel Fowler is a Social Scientist with Food Standards Australian and New Zealand (FSANZ). Ms Fowler works within the Consumer and Social Sciences (CASS) team at FSANZ. CASS conducts consumer and social research to better understand the effects that changes to the Food Standards Code have on consumers.

Lydia Buchtmann is Senior Communications Advisor with Food Standards Australian and New Zealand (FSANZ). Her area of interest relates to communication of perceive risk communication and their understanding of food regulation in Australia and New Zealand.

Dr Craig Cormick is the Manager of Public Awareness and Community Engagement for the Federal Government's National Enabling Technologies Strategy. He has been coordinating public attitude research and public engagement activities into biotechnologies and foods for over a decade, and is a regular commentator in the media and at conferences on drivers of public attitudes towards GM foods and other new technologies.

Associate Professor Alexandra McManus is Director of the Centre of Excellence Science Seafood and Health (CESSH) a national research centre housed within Curtin University and holds a position with the Curtin Health Innovation Research Institute. She has spent considerable time working in injury prevention, workplace health, child health and with indigenous populations. Her major research focus is improving the nutrition and physical activity status of communities.

Dr Trevor Webb, Senior Social Scientist with FSANZ is Heads of the Consumer and Social Sciences (CASS) team. The social sciences are a group of disciplines that study the behavioural and social dimensions of humans in groups and as individuals. They include psychology, consumer studies, sociology and human geography. As with the other sciences, the social sciences are theoretically driven and collect empirical data to understand and explain phenomena. The CASS has established the Social Sciences Expert Advisory Group (SSEAG) to help ensure their work is of high quality. The SSEAG comprises nine highly qualified academics from Australia, New Zealand and the United Kingdom (UK) across the social sciences disciplines.

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Outcomes from the Expert Consultation on the Risks and Benefits of Fish Consumption (Prof Andrew Sinclair)

Jogeir Toppe & David James
FAO

A more holistic approach is needed in order to give advice on balancing the risks and the benefits of consuming fishery products. The existing focus on links between seafood and contaminants on one side, and the links between consumption of seafood and health on the other side, is making it increasingly relevant to provide advice to governments in how to handle conflicting issues such as the risks and the benefits of consuming fishery products.

In general the levels of contaminants such as methylmercury and dioxins in seafood are well below the maximum levels established. However, some fishery products from polluted areas or predatory fish of big size can sometimes exceed the levels. This has persuaded some countries to give advice on limiting the consumption of such fish, in particular for vulnerable groups as pregnant women and children. While the intention was only to limit consumption of seafood known to have elevated levels of contaminants, the effect in some cases has been a significant reduction on the consumption of seafood. The target groups of this advice are at the same time heavily dependent on a nutritionally optimal diet to cover the needs of omega 3 fatty acids and iodine; essential for the early development of the neural system. Seafood is known to be the main natural source of these nutrients.

FAO organised an Expert Consultation group in Jan 2010 and the outcomes of the conclusions will be presented and discussed.

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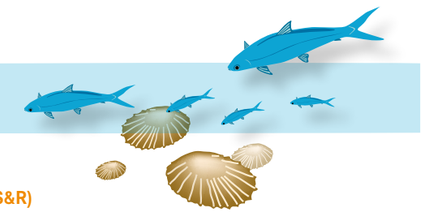
Guest Keynote

Dr Roberto Leonardi



Wednesday 10th November 2010 – Morning Sessions

10 Nov
10.45 - 13.45
Room 212 & 213

Health, Nutrition and Medical Science & Research (HNMS&R)

Cptn Joe Hibbeln
Chair Person

10 Nov, HNMS&R
10.45 - 11.05
Room 212 & 213

Brain-specific lipids from marine and lacustrine food resources: Now a recognized factor for the origin, migration and dominance of modern homo sapiens

Dr Leigh Broadhurst
Environmental Management and By-Product Utilization Laboratory
U. S. Department of Agriculture, USA

Long-chain polyunsaturated fatty acids (LC-PUFA) are dietarily essential, thus normal infant/neonatal intellectual growth and development cannot be accomplished if they are deficient during pregnancy and lactation. Abundant DHA and AA are needed to construct fetal and placental tissues, and sustaining normal adult human brain function also requires LC-PUFA. H. sapiens is unlikely to have evolved a large, complex, metabolically expensive brain in an environment which did not provide abundant dietary LC-PUFA.

The littoral marine and lacustrine food chains provide consistently greater amounts of pre-formed LC-PUFA than the terrestrial food chain. Dietary levels of DHA are 2.5-100 fold higher for equivalent weights of marine fish or shellfish vs. lean or fat terrestrial meats. Mammalian brain tissue and bird egg yolks are the richest terrestrial sources of LC-PUFA. Exploitation of shellfish, stranded/spawning fish and marine mammals; sea birds and eggs by Homo could have provided LC-PUFA for men, women, and children without an a priori requirement for organized hunting/fishing, or sophisticated social behaviour.

At South African Cape sites, shell middens and fish remains are associated with early modern human remains and the earliest known examples of modern cultural behaviour -- the latter clearly indicating that modern thought and communication patterns were developing. In fact, the earliest known human personal decoration consists of drilled seashell beads. Cape sites dating from 164-18 ka cluster within 200 km of the present coast. Increased synaptic connectivity, fueled by multi-generational access to pre-formed LC-PUFA, could be a reason why modern human behaviour arose in this environment.

Evidence of early H. sapiens is also found around the East African Rift Valley lakes and up the Nile Corridor into the Middle East. The Rift Valley is a unique tectonic province unmatched elsewhere on Earth, with lakes so extensive that they are correctly termed "proto-oceans." The successful migration of H. sapiens to Eurasia apparently depended upon coastal resources and routes. Water crossings must have been made in order to colonize Australia ca. 45-60 ka, Flores, Indonesia ca. 800 ka, and Crete ca. 130-700 ka. Such early development of seafaring implies adoption of the littoral environment by humans in a more consistent and widespread fashion than previously considered.

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Effects of omega-3 fatty acids epa versus dha on depressive symptoms in elderly people with mild cognitive impairment

Dr Natalie Sinn
Nutritional Physiology Research Centre
University of South Australia, Australia

Background: Depression is a risk factor for progressing from mild cognitive impairment (MCI) to dementia in elderly people. Omega-3 polyunsaturated fatty acid (n-3 PUFA) supplementation may assist with depressive symptoms although it is unclear whether eicosapenateonic acid (EPA) or docosahexaenoic acid (DHA) is more effective.

Objective: To investigate the impact of daily supplementation with EPA- versus DHA-rich fish oil capsules on depressive symptoms in elderly people with MCI over 6 months.

Design: Elderly people > 65 years of age were screened and recruited if they had MCI and had not consumed fish oil supplements during the previous 3 months (N=50). They were block-randomised on age, gender and depressive symptoms using the Geriatric Depression Scale (GDS) to one of the following conditions: 1128mg EPA + 175mg DHA/day; 252mgEPA + 1128mg DHA/day or 1464 mg linoleic acid (LA)/day (placebo). They provided blood samples and completed cognitive assessments and questionnaires at baseline and 6 months (completers: N=36). GDS outcomes are reported here.

Outcomes: GDS scores improved in the EPA (baseline M=3.86±3.80; 6mo M=3.43±3.36) and DHA groups (baseline M=3.15±3.08; 6mo M=2.54±2.79) and worsened in the LA group (baseline M=2.25±1.91; 6mo M=3.38±1.85); however these were not statistically significant. After removing one outlier from the placebo group these differences became highly significant (EPA p=.03, DHA p=.01).

Conclusion: These preliminary data suggest that depressive symptoms might be reduced in elderly people with MCI following supplementation with DHA-rich or EPA-rich fish oil. This may assist in ameliorating their risk for progressing to dementia. Future studies with elderly people who have MCI should assess depressive symptoms and provide follow-up of treatment with n-3 PUFA and dementia risk.

Source of funding: This research was funded by an ARC-Linkage Grant in partnership with Novasel Australia. CM is supported by a South Australian Department of Health Scholarship.

10 Nov, HNMS&R
11.20 - 11.35
Room 212 & 213

Diet as a modifiable risk factor for the common mental disorders

Dr Felice Jacka
University of Melbourne, Clinical and Biomedical Sciences, Barwon Health Campus

Dr. Felice Jacka has published two of the first articles worldwide concerning the association between diet and depression in both adolescents and adults (2010), and the first article to report a role for dietary magnesium in

depression (2009). Her continuing research focuses on the development of the evidence base concerning the role of diet quality in both depression and anxiety - a research field that has previously received scant attention. With a background in psychology and a strong interest in nutrition and public health, she hopes that her work will support a preventative approach to mental illness and will lead to better outcomes for those affected by these illnesses. Recent work has focused on teenagers and the connection between what they eat and depression.

10 Nov, HNMS&R
11.35 - 11.50
Room 212 & 213

Four dietary models using Fish, Lean Red Meat and LC n-3 PUFA enriched foods are able meet national dietary recommendations for LC n-3 PUFA

Dr Flavia Fayet
Discipline of Nutrition & Metabolism, School of Molecular Bioscience
The University of Sydney, Australia

Background: Australians are not meeting LC n-3 PUFA (DHA, EPA, DPA) intake recommendations for chronic disease prevention. There is a need to explore more practical options of achieving recommended LC n-3 PUFA intake, which include enriched foods and drinks.

Aim: To develop a database on LC n-3 PUFA enriched products and to undertake a dietary modeling exercise using four dietary approaches to meeting the national targets for LC n-3 PUFA intake for different life-stages.

Methods: Six LC n-3 PUFA enriched products were identified; eggs, yoghurt, milk, flavoured beverage powder, almond meal and bread. High LC n-3 PUFA fish was defined ≥ 1200mg/100g, medium LC n-3 PUFA had 200-1200mg/100g and low LC n-3 PUFA had < 200mg/100g. Average LC n-3 PUFA for red meat was 119mg/100g. The four models were; (i) ≥2 high omega-3 fish serves per week (no meat or supplements), (ii) >1 < 2 high omega-3 fish serves per week, (iii) zero serves of fish per week (meat and enriched foods) and (iv) lacto-ovo vegetarian diet (enriched foods only). Serves of fish, red meat, dairy, eggs and cereals were modeled based on current National Dietary Guidelines for Australians. Diets were modeled using NUTTAB2006 foods database and calculated to meet both the Adequate Intake (AI) and the Suggested Dietary Targets (SDT) in the Nutrient Reference Values. SDTs for children <14y were calculated based on energy intakes.

Results/Discussion: Weekly food intake to meet LC n-3 PUFA intake for all life-stages.

Conclusion: The SDT can be easily achieved with two high LC n-3 PUFA fish serves per week without red meat and enriched foods. Fish avoiders who consume red meat can meet SDT recommendations via four serves of red meat/week supplemented by at least 20 serves of enriched foods, while lacto-ovo vegetarians need at least 37 serves of enriched foods. Subject to the bioavailability of enriched foods, these diets meet the SDTs for all life-stages.

10 Nov, HNMS&R
11.50 - 12.05
Room 212 & 213

Metabolic fate of 14c-dpa (22:5n-3) in Rats: a comparison with epa and dha

Gunveen Kaur
Metabolic Research Unit, School of Exercise and Nutrition Sciences,
Deakin University, Australia

A recently published study has shown that, in rats, DPA supplementation led to deposition of DPA in various tissues. Part of the supplemented DPA was retro-converted to EPA with minimum conversion into DHA. However, it is not known what proportion of ingested DPA is -oxidised to form CO2 compared with deposition of DPA in various tissues. Therefore, the aim of the current study was to determine the extent to which the 14C-DPA was catabolised to CO2 compared with EPA and DHA and to examine the incorporation of label into the various tissue lipids.

Twenty 3-wk-old male weanling Wistar rats were administered a single oral dose of 2.5µCi of 1-14C-DPA or 1-14C-EPA or 1-14C-DHA or 1-14C-oleic acid (OA). After dosing, the animals were immediately placed in a metabolism chamber for the next 6 hours. The exhaled 14CO2 was bubbled into a trapping solution and counted for radioactivity. 24 hours after dosing the animals were euthanized and tissues were removed. Tissue lipids were extracted and counted for radioactivity. Thin layer chromatography was performed to separate the lipid fractions, which were then counted for radioactivity.

It was observed that OA led to significantly greater label ($p<0.05$, n=5 per group) in the collected CO2 after 6 hrs compared with EPA (by 1.4 fold) DPA (by 3.6 fold) & DHA (by 4.1 fold). The amount of 14CO2 collected for EPA was significantly higher than that of DPA and DHA by 2.5 and 2.8 fold, respectively. The results from analysis of tissue lipids showed that DPA was highly incorporated in heart (153 picomoles/g tissue) compared with OA (10 picomoles/g tissue). EPA and DHA were highly incorporated in liver (190 and 158 picomoles/g tissue, respectively), compared with OA (5 picomoles/g tissue). All the three n-3 LCP including DPA showed an approximately 3 fold higher incorporation into the phospholipid fraction compared with OA in all tissues. In conclusion, this study showed that DPA is more conserved from beta-oxidation compared with OA and EPA. It is mainly deposited in tissues like adipose, heart and liver. Higher incorporation of DPA in heart and in PL fraction, might suggest that DPA has a beneficial role in heart tissue. Further analysis of conversion of DPA into EPA or DHA in these animals is currently underway.

10 Nov, HNMS&R
12.05 - 12.20
Room 212 & 213

Compliance to fish intake recommendations are highest at the three month time point of a twelve month randomised controlled trial

Ms Elizabeth Neale
Smart Foods Centre
University of Wollongong, Australia

Observational studies have associated increased fish consumption with a range of health benefits, including reduced incidence and mortality from cardiovascular diseases. However, food-based clinical trials examining the effect of increased fish intake on specific health outcomes are required to provide direct evidence for such health benefits. Measuring participant compliance to dietary recommendations within a clinical trial is essential for accurate analysis of outcomes. The aim of this study was thus to measure changes in fish intake in a group of overweight volunteers in a trial testing for dietary fat and weight loss, where fish intake was significant [ACTRN12608000425392].

Participants were randomised into a control (no specific advice on fish consumption given), and two intervention groups (advised to consume 180g fish/wk). Diet history assessments were taken at baseline (n=118), three (n=86) and 12 months (n=64). Fish intake (which included fish and seafood products as classified by the 1995 National Nutrition Survey) was calculated as mean grams per day at each time point. Change in fish intake over 12 months was calculated via a Friedman test, and the proportion of participants meeting the recommendations to consume 180g fish/wk was determined.

Over the 12 month period, control group participants decreased their fish consumption, whilst participants in the intervention groups increased their fish intake overall. The greatest changes in fish consumption were seen at the three month time point, as shown in Table 1.

Table 1: Mean + SEM total fish and seafood (g/day) consumed at baseline, 3 and 12 months.

Study group	Baseline	3 months	12 months	p-value
Control	42.97 ± 6.59	33.61 ± 4.58	36.32 ± 5.66	0.846
Intervention	32.62 ± 3.53	44.69 ± 4.98	38.88 ± 3.99	0.072

The percentage of participants in the intervention groups complying with study recommendations for fish intake increased from 47% at baseline to 68% at three months, and 57% of participants consumed the recommended amount of fish at 12 months.

Compliance to study recommendations for fish intake was greatest at the three month time point of a 12 month food-based intervention. This level of compliance is similar to that reported by studies of a comparable duration and may reflect participant fatigue. A substantial proportion of the intervention group participants did not comply with study recommendations at all measured time points, highlighting the importance of accurately measuring compliance during dietary studies. Future studies may increase compliance to fish recommendations by providing participants with pre-packaged fish, which may also overcome methodological issues such as measurement of the amount of fish in mixed dishes.

Funding source: NHMRC project grant (514631) Tapsell, Batterham, Charlton.

10 Nov
10.45 - 13.45
Room 219

Food Security and Sustainability (FS&S)

Grahame Turk
Chair Person
Managing Director, Sydney Fish Market & Director NAC

10 Nov, FS&S
10.45 - 11.05
Room 219

Endangered Species – The Fisherman

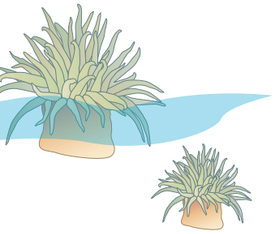
Bill Passey
Managing Director of Australia Bay Fisheries and has been a professional fisherman for well over 40 years having started as a 14 year old.

"We fish more than 20,000 square miles and no one monitors the resource more than us. We are the ones with the big money invested," Bill says. So while the 40 tonnes of fish brought into the Darwin wharf every 10 days looks big, it's yet to make a dent on the oceans worked by Bill Passey's two trawlers, the FVTerritory Leader fishing Northern Territory and unloading in Darwin, and the FV Ocean Harvest fishing in the Gulf of Carpentaria and unloading in Weipa. Bill's hobby also involves fish as he has produced many Grand Champions for the Koi Society of Western Australia.

10 Nov, FS&S
11.05 - 11.20
Room 219

Why we chose MSC

David Carter
CEO, Austral Fisheries Ltd



Originally a Melbourne boy David has been involved with Austral for well over 30 years.
Austral is a fishing company with many millions of dollars invested in quotas and fishing rights around the country. This heavy investment, coupled with Australia's strong 'rights based' system of fisheries management, ensures that they have a powerful self interest to ensure that our target species and the ecosystems that support them are in the best possible condition. As a consequence of this self interest we have become active participants and partners in the process, of supporting and informing the science of fisheries. We remain prominent in the management processes, which are required to take the outputs of good science and apply them to the real world challenges of fisheries management. Beyond formal process of fisheries management and science, Austral has a strong tradition of engagement and cooperation with key NGO's on a range of issues, including protection of toothfish from illegal fishing, development of marine protected areas and, of course, certification of the Heard Island Mackerel Icefish fishery to the standards required of the Marine Stewardship Council.

With David at the helm, Austral has strived to have the best people on the best boats producing the best possible fish and prawns. They value relationships and transparency; honest, good clear communication and, above all, our integrity.

10 Nov, FS&S
11.20am - 11.35am
Room 219

Responsible Fishery Management and Sustainable Seafood-A New Assessment Model

Randy Rice
Alaska Seafood Marketing Institute, USA

"In recent years, the seafood marketplace has called for more documentation and proof on the issue of responsible fisheries and sustainable seafood. As seafood operators strive to demonstrate their commitment to social and corporate responsibility, the use of 3rd party certification has increased. Previous recognition, historical track record, presence of legal governance structure, and global reputation of responsible fishery management (RFM) are no longer sufficient in some markets. As a result, there has been a proliferation of eco-labels, many by NGO groups or aquaria. These labels and groups communicate to retailers, buyers, and importers that if their particular endorsement or certification is in place, then a buyer can be assured of RFM. Some of these programs involve costly logo licensing fees, and others have resulted in the obscuring of the origin of the product. This presentation will highlight a new RFM assessment model being developed inAlaska. The use of an independent 3rd party certifier with direct assessment to the United Nations Food and Agriculture Organization (FAO) Code of Conduct for Responsible Fisheries (Code) offers a streamlined, cost effective method for evaluation of fishery management against the world's most accepted set of principles and guidance for RFM. Though the FAO Code is often used as a template by NGO groups, often additional interest-driven criteria are added, or selected only portions of the Code are utilized in the creation of a particular group's standards. The Alaska model will utilize the entire Code as well as the FAO Guidelines for Eco-labelling, will highlight origin, and will not involved logo licensing fees. The Alaska model will follow internationally accredited International Standards Organization (ISO) 65 certification procedures. Similar efforts are underway in Iceland. The emergence of these new RFM assessment approaches demonstrates that credible certification that is not NGO agenda-driven, a streamlined certification process, and cost effectiveness can be accomplished. "

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Room 219

Seafood ia a health food – why choose Australian Seafood?

Ted Loveday
Managing Director at Seafood Services Australia Ltd
Masters , Environmental Management (Sustainable Development), 1997 – 2001 (UQ)

Ted has over 30 years experience in the seafood industry, including 20 years as operator of commercial fishing businesses. He has extensive experience as a Director and member on many seafood industry boards and committees.

In 2003 was a worthy winner of the Australian Seafood Industry's 'Seafood Icon' Award.
Ted has substantial experience in the Australian Fishing Industry and has had many achievements to be rightly proud of, not the least of these, is the Environmental Management System which has received recognition globally.

10 Nov, FS&S
11.50 - 12.05
Room 219

The New Zealand Story

Alistair MacFarlane
General Manager – Trade and Information
NZ Seafood Industry Council

The advent of refrigerated shipping over 130 years ago enabled New Zealand's economy to develop its fundamental economic base as a producer of food for world markets. The declaration of New Zealand's Exclusive Economic Zone in the late 1970s and the establishment of its comprehensive Quota Management System in 1986 enabled the seafood sector to take its place as one of New Zealand's key food sectors. The QMS now encompasses over 600 stocks and over 100 species in a comprehensive system of perpetual, tradeable harvest rights, while the management system is built on the twin pillars of sustainability and utilisation. Aquaculture, despite regulatory restriction in recent years, is now poised to grow from its current contribution of 15% of total seafood production.

This paper will demonstrate that putting in place an access and management system based on secure access rights that incentivise rights owners to safeguard stock sustainability is producing an industry that places real value on fish stock abundance and high standards of environmental performance.

Despite having been independently judged as meeting "best practice" in fisheries management, the New Zealand government and industry are, nonetheless, subject to constant criticism from environmental organisations for failing to meet their ever rising expectations of environmental performance. This paper will discuss the necessity for the New Zealand seafood sector to build public confidence.

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The Story of Aquacultured Salmon

Linda Sams
Chief Sustainability Officer at Tassal Ltd

Linda came to Australia from her home in Canada and has been taking Australia's leading publicly listed Atlantic Salmon harvester down a strategic sustainability pathway.

With learning from Marine Harvest and Ocean Industries, Linda's arrival was timely at Tassal. By taking a longer term view Linda is considering the implications of social, economic and environmental factors in an integrated manner. This aims to reduce any environmental impacts as a result of our economic activities. After all, it is these environmental aspects that our activities rely on to produce high quality Tasmanian salmon.

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Room 216

Human Behaviour and Communications (HB&C)

Angus Callander
Chair Person
Director SEA and WAFIC & Seafood Consultant

10 Nov, HB&C
10.45 - 11.05
Room 216

The "howmuchfish.com" model: Using the internet to promote a balanced risk assessment model for seafood consumption.

David Martosko
The Center for Consumer Freedom
Washington DC, USA

The professional and scientific literature contains little evidence of strategic thinking about communicating public health messages via the Internet. It is particularly silent about online presentations of food-safety risk assessments. Polling shows that more than 40 percent of U.S. women want "a simple Internet website to help me sort out the risks and benefits of eating more fish." The U.S. seafood-safety debate has lacked the complexity required to present both risks and benefits simultaneously. Accordingly, neither the government nor any NGO has constructed an online tool that communicates about seafood in a balanced fashion.

Environmental groups have generally presented one-sided (risk only) models that exaggerate the meaning of methylmercury measurements and ignore the health benefits of seafood consumption. And government seafood advisories, by causing panic in underprivileged communities, have caused the very public health harms they were intended to prevent.

HowMuchFish.com seafood measurements reflect both mercury contamination and health-beneficial nutrients. The calculator profiles 24 species and adapts itself to the weight of the user and his/her preferred seafood. Four different serving sizes are selectable, corresponding to hors d'oeurve, appetizer, lunch, and dinner portions.

Along with methylmercury-based projections of theoretical health risks, the calculator returns levels of omega-3s (EPA+DHA), protein, vitamin B12, potassium, selenium, and iron. Nutrient levels are reported as raw numbers and as percentages of Recommended Daily Intake, (U.S. Department of Agriculture nutrition advice). It also provides fat, sodium, and calorie measurements for each seafood portion, along with cholesterol advice.

It is expected that consumers exposed to balanced information about their seafood choices will more thoughtfully consider the negative health impact of eliminating seafood from their diets—hopefully on par with their concerns about health risks related to methylmercury.

Opinion research corporation
Percentage of U.S. females who "strongly" or "somewhat" agree:

- 50% – "Even though fish is full of important nutrients, mercury and other contaminants make it risky to eat."
- 41% – "For pregnant women, the health risks of eating fish outweigh any health benefits."
- 41% – "I wish there was a simple Internet website to help me sort out the risks and benefits of eating more fish."
- 38% – "Tuna is a high-mercury fish that can harm the health of women and children."
- 30% – "Women should eat less fish because mercury levels in seafood pose a danger to their health."

- 18% – "I eat less fish today than I did five years ago, because I'm concerned that it might not be safe."

1,000 U.S. women polled August 5-8, 12-15, 2010

10 Nov, HB&C
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Room 216

Conquering consumers – concerns about seafood taste with online tools: blogaboutseafood.com and pickmyfish.com

Jennifer McGuire, MS, RD*
National Fisheries Institute
McLean, USA

Taste is the leading reason people choose to buy a food. Or not choose a food – "I don't like the taste/my family doesn't like the taste" is the biggest barrier to eating seafood. To address this concern, the National Fisheries Institute created the following online tools:

BlogAboutSeafood.com
A Peek into What Plenty of Seafood Looks Like in Real Life

Over a dozen health organizations endorse eating fish at least twice a week. But most people who eat a typical Western diet fall short by a long-shot. BlogAboutSeafood.com shows people just how scrumptious seafood at least twice a week can be by following the fish-rich diet of dietitian Jennifer McGuire.

PickMyFish.com
A New Tool to Help People Pick their Seafood Soul Mate

With all the different species of seafood, there's a type of fish or shellfish for every appetite. Now there is a new tool to help people find their favorites. Simply select taste, texture, flake, and color preferences, and PickMyFish will generate tailored seafood recommendations. Or skip straight to quick fish descriptions A-Z. This portable tool can be used on any computer, smart-phone, or iPad to end indecision with mouth-watering menu choices and scrumptious selections at the store.

Analysis of web visits shows BlogAboutSeafood.com is the second most visited page on AboutSeafood.com. Promotion of PickMyFish.com began in fall 2010.

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Room 216

Seafood and Health: Teacher resource for secondary students

Avinna Trzesinski
Centre of Excellence for Science
Seafood and Health (CESSH), Australia

The Centre of Excellence for Science, Seafood and Health has produced the Seafood and Health: Teacher Resource for Secondary Students to develop students understanding of the benefits of seafood for health within the Health and Physical Education component of the Western Australian curriculum.

Good nutrition for adolescents is identified as an integral part of positive future health outcomes into adulthood. Health and physical education studies can influence knowledge, attitudes and behaviour toward healthy eating and good food choices.

Seafood as part of a healthy diet can have a significant impact on the outcomes of health. Seafood consumption significantly reduces all cause mortality rates, and is protective for several chronic health conditions including heart disease and type 2 diabetes.

Children introduced to seafood from a young age are more likely to consume seafood as an adult, and there is emerging evidence on the positive effects of seafood for asthma, mental health, behavioural problems and weight management for young people.

Adolescence is a time of rapid growth and development and the promotion of healthy eating as well as the promotion of the benefits of seafood consumption should be continued and encouraged. Adolescents in Australia are consuming too much saturated fat and not enough omega-3 PUFAs. Seafood is a whole food package which is low in saturated fats, high in vitamins and minerals, and rich in omega-3 PUFAs essential for the development and maintenance of a healthy body.

The Seafood and Health Teacher resource for secondary students is based on activities and assignments from the 2010 Health and Physical Education curriculum. The resource activities can be utilised independently or sequentially, for use in diverse classroom contexts. It is designed to be easy to understand, factual and engaging, as well as meaningful and relevant to students and facilitate co-operative learning. It aims to raise awareness of the benefits of seafood consumption as part of a healthy diet through varied choices of topics, and allows students to work through concepts and processes supportive of health promoting food choices. It also promotes meta-cognition so that students can continue to learn about food issues and behaviours in new life situations.

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Some facts and fallacies about prawn consumption and its influence on general health and libido

Nick V. Ruello
Ruello & Associates Pty Ltd
Clifton Beach, Australia

Prawns have been a part of the Australian seafood range since early British settlement and became a significant seafood export item more than 100 years ago and are now one of the most popular seafoods here and around the world.

Despite the economic and culinary importance of prawns there is widespread confusion and uncertainty about prawns' nutritional and chemical characteristics, particularly their influence on libido, allergies and general health and there remains an overstated fear of eating too many prawns because of their "cholesterol content". Furthermore few Australians are aware of the diverse contribution prawns have made to our culinary, sporting, cultural and political history. This paper reviews some of the facts, fallacies and fascination about prawns, particularly as they relate to the Australian diet and lifestyle.

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11.50 - 12.05
Room 216

Public perceptions of the risks and benefits of wild versus farmed fish consumption

Dr Anne Katrin Schlag
King's Centre for Risk Management
King's College London, England

Fish consumption is estimated to increase. In the context of diminishing wild supplies more seafood will be the product of aquacultural activities (FAO, 2006). Aquaculture is following wider trends in the development of agriculture, becoming more and more intensive with the aim of increasing production and profit margins. But in modern agriculture there are negative consumer perceptions about health and environmental risks, animal welfare, genetic modification (GM), and trust and regulation (Lofstedt, 2006). Although traditional fish farming has been practised for centuries, modern aquaculture with its diverse production methods and novel technologies may also incur future public perception problems (Burgess & Tansey, 2005; Verbeke et al., 2008; Schlag, 2010). This is problematic because of the well-established benefits of fish consumption for human health.

The present study aims to better understand lay perceptions of wild and farmed fish to be able to anticipate and address consumer concerns timely and efficiently.

This presentation summarizes the results of 28 focus group discussions conducted in the capitals of seven European countries: France, Germany, Greece, Italy, Spain, Norway and the UK. Focus groups commenced between January and March 2009 and data was analyzed with the qualitative software Atlas/ti (Muir, 1998).

Fish is regarded as a healthy food. The perceived health benefits of fish consumption clearly outweigh the risks, but farmed fish is viewed as less healthy. Also, there are notable knowledge and attitude divergences between countries. Moreover, lay risk perceptions of fish consumption frequently differ from the scientific assessments and consumers are often confused with regards to expert terminology and current government guidelines.

Consumers are generally unfamiliar with farmed fish and fish farming and perceive wild fish much more positively. However, there are no strong prejudices against farmed fish as consumers weigh up health benefits and risks, indicating that perceptions are often ambivalent.

This unfamiliarity and ambivalence highlights the need for improved government communications about fish consumption, farmed or otherwise. The broad range of cross-national differences indicates the challenges that may lie ahead for developing effective risk communication strategies with various countries' publics.

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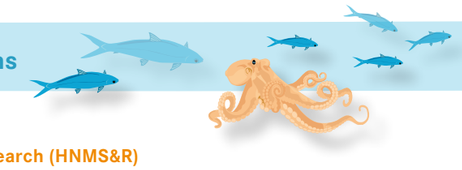
12.05 - 12.20
Room 216

Effective communication: what works with whom!

James White
Graphic Designer, Centre of Excellence Science, Seafood & Health, Curtin University

James White is a graphic designer with the Centre of Excellence in Science Seafood & Health at Curtin University. He is a qualified teacher whose work has taken him to many places from London UK to Ghana in Africa. James has a passion for effective communication and has particularly expertise in communication through electronic mediums.

Wednesday 10th November 2010 – After Lunch Sessions



10 Nov
13.15 - 16.00
Room 212 & 213

Health, Nutrition and Medical Science & Research (HNMS&R)

Prof Michael Crawford
Chair Person
Director of the Institute of Brain Chemistry and Human Nutrition
London Metropolitan University, United Kingdom

10 Nov, HNMS&R
13.15 - 13.35
Room 212 & 213

Correlation between multichannel taste sensor and human gustatory sensation of potassium chloride-added low-sodium salt

Masaaki Tagata
Yaizu Suisankagaku Industry Co., Ltd.
Shizuoka, Japan

In recent years, the research method of using a multichannel taste sensor has become a new way of evaluating the taste and quality of foods such as beverages and seasonings. Potassium chloride (KCl) acts as an effective salt substitute, but it increases the bitterness. Therefore, it seems difficult to have a Low-sodium Salt using KCl with good taste which can meet the needs of the market. In this research, we evaluated the bitterness of KCl, investigating the taste of both sodium and potassium chloride in the Low-sodium salt form. Our research purpose is to understand the correlation between the multichannel taste sensor result and the human gustatory sensation result, and to examine the effective of Fish peptides as suppressing agent toward KCl bitterness.

The test samples were evaluated in terms of the saltiness and the bitterness. The measured tastes of the samples were numbered to get the total points by the "Ranking Method". These total points of test samples were verified by "Kendall's rank correlation coefficient" in order to examine the total points.

The multichannel taste sensor was able to distinguish the difference of the NaCl and KCl concentrations. The commercially salt samples were mapped on the different position by the taste sensor. The results of which matched the human gustatory sensation test. In conclusion, by using this method of evaluating the salts, the taste sensor test showed a high correlation with the results obtained in the human gustatory sensation tests. "Fish peptides", developed by our unique technology, were necessary to mask the bitterness of KCl, serve good taste.

10 Nov, HNMS&R
13.35 - 13.55
Room 212 & 213

PUFA status and response to omega-3 PUFA treatment in children with attention deficit hyperactivity disorder: role of phospholipase a2

Catherine Milte
Nutritional Physiology Research Centre
University of South Australia, Australia

Phospholipase A2 (PLA2) enables functions of polyunsaturated fatty acids (PUFA) by releasing them from membrane stores. Thus abnormalities in PLA2 activity could account for the altered PUFA status in attention deficit hyperactivity disorder (ADHD) and variation in the response to omega-3 PUFA supplementation.

This study investigated associations between PLA2 activity and erythrocyte PUFA status and whether PLA2 activity modulates responses to n-3 PUFA supplementation in children with ADHD. Ninety children with ADHD symptoms were recruited for a double-blind, placebo-controlled trial and randomised to take a supplement rich in EPA (1000 mg EPA + 120 mg DHA/day), DHA (240 mg EPA + 1000 mg DHA/day) or n-6 PUFA (safflower oil) for 4 months. Erythrocyte PUFA status, assessments of attention, cognition and literacy and Conner's Parent Rating Scales were evaluated at baseline and 4 months; activity of PLA2 in plasma was assessed at baseline.

Seventy-five children at baseline and 44 children at 4 months provided blood samples for assessment of erythrocyte PUFA and PLA2 activity. Higher PLA2 activity was associated with lower erythrocyte EPA status at baseline (p=.017, r=-.28). However, baseline PLA2 activity did not influence change in PUFA status over the 4 months. Including PLA2 activity in regression analysis strengthened some of the relationships between changes in PUFA status and parent-reported behavioural outcome measures over the 4 months, specifically restless/impulsiveness and ADHD symptoms. In these cases, lower PLA2 activity was associated with greater improvement in the behavioural outcome.

PLA2 may modulate responses to PUFA supplementation, whereby lower activity in associated with greater improvements in behaviour and cognition. This is a preliminary finding and the influence of PLA2 activity should be further assessed in ADHD and other mental health problems.

10 Nov, HNMS&R
13.55 - 14.15
Room 212 & 213

Fish, omega-3 fatty aids, and inflammation: A review of the literature in older adults

Dr Jessica Grieger
Nutrition and Dietetics
Flinders University, Australia

The combination of increased life expectancy and the decline in birth rates reflect the ageing population in Australia. During ageing, a number of changes occur including a compromised immune system due to persistent increases in pro-inflammatory markers. Specifically, chronic has been implicated in the etiology of several diseases including cardiovascular disease (CVD), diabetes, rheumatoid arthritis, cancer and neurodegenerative diseases. Diet may play a key role in ameliorating inflammation and reducing the burden of a number of diseases. Fish, seafood and fish products can be a good dietary source of many nutrients including zinc, iodine, calcium, vitamin D, and antioxidants: selenium and vitamin E. Fish also contain essential fatty acids, eicosapentanoic acid (EPA, 20:5 n-3), docosahexanoic acid (DHA, 22:6 n-3) and some docosapentanoic acid (DPA, 22:5 n-3); most notable for their inflammatory effects. Despite a wealth of literature encompassing the effects of fish consumption in young and/or healthy populations on markers of inflammation, little work has been conducted in older adults. Although some positive associations have been reported in population based cohort studies, the effects of increased fish consumption on inflammatory markers in randomized controlled studies have been inconsistent. Given the biological changes that occur with ageing, their compromised inflammatory status, and the limited evidence in older populations, further randomized studies are needed to support the plausible mechanism by which omega 3 fatty acids reduce inflammation. This may further reduce risk for cardiovascular and related diseases.

10 Nov, HNMS&R
14.15 - 14.35
Room 212 & 213

Docosapentaenoic acid (22:5n-3) - Buffer, buffoon or the full bottle?

Prof Andrew Sinclair
School of Medicine (Metabolic Research Unit)
Deakin University, Australia

Long chain omega 3 polyunsaturated fats are essential nutrients which play an important role in brain and cardiovascular function, and in reducing pain and inflammation in conditions such as rheumatoid arthritis. There are three such omega 3 fats (EPA, DPA & DHA). EPA is regarded as important for inflammation and heart function; DHA is regarded as crucial for brain function. The role of DPA is unknown.

Many studies have shown cardiovascular, arthritis relief or neural benefits of consuming fish or fish oils. The benefit is due to the fish or fish oils containing omega 3 fatty acids. Typically, fish and fish oils contain EPA, DPA and DHA.

EPA and DHA have been studied as individual compounds and shown to contribute to the benefits described above. DPA has not been studied in humans; there are a handful of studies on DPA in cell culture and animals as outlined in our recent review of the topic (Kaur et al Progress in Lipid Research 2010). The review includes our recent animal study on DPA (Kaur et al British Journal of Nutrition 2009). A major reason DPA has not been studied is because it has not been available pure in sufficient quantity to conduct human or animal studies.

This talk will discuss recent data which shows that:
[i] DPA is converted readily to EPA (in a cell culture system & in an animal study); this suggests DPA might be a 'buffer' omega 3 fat which assists in maintaining the bulk EPA level in tissues,
[ii] DPA is converted slowly to DHA in an animal study; if this occurs in humans it would demonstrate the DPA was 'the full bottle" since DHA is regarded as the king of omega 3 fats by many,
[iii] DHA and DPA are conserved in the whole animal compared with EPA which is rapidly excreted (based on tracer studies using carbon-14 labelled omega 3 fatty acids).

These novel data indicate that further studies of the role of DPA in mammals should be conduucted.

10 Nov, HNMS&R
14.35 - 14.50
Room 212 & 213

Saving our Plant and Ourselves

Prof Michael Crawford
Director of the Institute of Brain Chemistry and Human Nutrition
London Metropolitan University, United Kingdom

10 Nov
13.15 - 16.00
Room 219

Food Security and Sustainability (FS&S)

Justin Fromm
Chair Person
Director of Seafood Services Australia Ltd and outgoing CEO, National Aquaculture Council

10 Nov, FS&S
13.15 - 13.35
Room 219

Aquaculture and the fish oil crisis: are farmed fish a good source of omega-3?

Prof Giovanni M. Turchini
School of Life and Environmental Sciences
Deakin University, Australia

Long chain omega-3 fatty acids (n-3 LC-PUFA) are only found in adequate concentrations in fish and seafood. They are fundamental nutrients for human health and development and are also beneficial in combating several diseases typical of western societies. However, overexploitation of the oceans over the past five decades has led to a decline in the harvest of commercial fisheries as the result of an increasing demand for fish and seafood. This situation has lead to colliding policies: recommendations to support the health of marine ecosystems and endorse the sustainable utilisation of wild fish stocks, versus the promotion of human health through increased n-3 LC-PUFA consumption. In this context, a third player has to be considered: fish farming, also known as aquaculture.

Aquaculture, which already accounts for approximately half of the fish and seafood consumed worldwide, could potentially solve this problem, however, it still has a significant hurdle to overcome. Fish oil, which is used by carnivorous fish (the majority of currently cultured species) to build fatty acids, is an essential ingredient of aquaculture feed. In a vicious circle, fish oil can only be derived from wild harvested fish, thus exacerbating the problem. Currently feed industries manufacturing aquaculture feed (aquafeed) are increasingly replacing fish oil with readily available terrestrial alternative oils. However, all the major alternative oils currently used, such as vegetable oils and animal fats, are characterised by their unique fatty acid composition, but have one common characteristic; none contain n-3 LC-PUFA.

It is now well accepted and documented that the fatty acid composition of aquafeed is mirrored in the fillet of cultured fish. Therefore, any reduction in the inclusion of fish oil will result in a reduction of dietary n-3 LC-PUFA, which will inevitably translate to a significantly lower content of the beneficial n-3 LC-PUFA in final edible products produced via aquaculture.

After a brief overview of the current status of fish oil replacement in aquafeed, this paper will address the question of whether cultured fish are, or are not, a good source of n-3 LC-PUFA. Possible insights of future aquaculture direction will be discussed.

10 Nov, FS&S
13.35 - 13.55
Room 219

Towards aquafeed security and sustainability - development of land plant sources of health-benefiting long-chain omega-3 oils

Dr Peter Nichols
**CSIRO Food Futures Flagship, Marine and Atmospheric Research, Hobart, TAS 7000, Australia*

Long-chain (≥C20, LC) omega-3 oils [e.g. eicosapentaenoic acid - EPA, 20:5(n-3) and docosahexaenoic acid - DHA, 22:6(n-3)] have health benefits against coronary heart disease, rheumatoid arthritis and other disorders, and DHA together with arachidonic acid – ARA [20:4(n-6)] – are increasingly being added to infant formula to enhance infant development. Microalgae are the primary producers of LC omega-3 oils which are transferred up the marine food chain, and ultimately into humans via seafood consumption. Microbial DHA oils have captured a significant portion of the infant formula market, however, fish oils are generally the main current source of LC omega-3 oils, with aquaculture now utilizing ~90% of global supplies. The increasing world population and increasing demand for LC omega-3 oils means that new sources of these unique oils are required.

The CSIRO Food Futures National Research Flagship initiated research in 2003 aiming to transfer LC-polyunsaturated fatty acid (LC-PUFA) genes from novel Australian microalgae to land plants. The project seeks to achieve sustainable production of land plant sources of LC omega-3 oils. Other research focusses on incorporation of these beneficial oils into farmed fish, livestock and food products, with aspects of stability and bioactivity under investigation.

Our team was first to produce DHA in a land plant (Robert et al., 2005) and has recently focussed on identifying genes and strategies to increase the flux from C18 fatty acids through to ARA, EPA and DHA. A suite of desaturase and elongase genes have been isolated from endemic Australian microalgae with a range of genes characterized and transferred to both model and crop plants. The team is value-adding with omega-3 oils across other research areas. Stearidonic acid [SDA, 18:4(n-3)] containing Echium oil has been used to enrich farmed Atlantic salmon and other livestock (e.g. chickens) with SDA, and via subsequent conversions, EPA and DHA. In terms of oil stability, LC omega-3 oil is more resistant to rancidity when DHA is located at the TAG sn-2 position compared to sn-1(3).

The ability to produce LC omega-3 oils from higher plants offers potential alternative sources of these health-benefiting oils for use in human nutrition, biomedical applications and importanly in aqua- and other feeds. The availability of new and renewable sources of LC-omega-3 oils will reduce pressure on global wild fisheries, and thereby assist in improving their sustainable exploitation. Such developments will importantly enable wider uptake of these key ingredients, particularly in aquaculture, with resultant global health, social and economic benefits.

Robert, S. S. et al. (2005) Metabolic engineering of Arabidopsis to produce nutritionally important DHA in seed oil. Functional Plant Biology 32: 473-479.

10 Nov, FS&S
13.55 - 14.15
Room 219

Aquaculture development and opportunity in the Middle East and North Africa (mena)

Prathapachandra Shetty
Executive Director
Emirates Star Fisheries, Dubai U.A.E

The MENA region represent one of the most diverse land mass, with huge swaths of desert and semi desert ecosystems, with scare water availability, plenty of estuarine and coast lines, less or very little human settlements, Expect for countries like Iran, Egypt, Israel, Syria etc. have large cities in the coastline. Most of the countries of MENA region have long coastline, with burgeoning traditional fisheries and not much of modern development, except for countries like Egypt, Iran, and Morocco where there is mechanization of fisheries. There seems to be immense potential of sustainable Aquaculture development, both coastal Aquaculture and Mariculture. However Egypt and Iran has well developed aquaculture system for Tilapia & Shrimp. Recent decade Saudi Arabia made tremendous advancement in shrimp farming, along coastal Red Sea.

Though this region has immense potential, Aquaculture development is very little. According to FAO (2008) total world fish production was 142 million ton, out of which 37% from Aquaculture (52 Million Ton), and in MENA region the total fish production was 3.58 million ton, representing 2.5% of global fish production, surprisingly Aquaculture production was 0.92 Million Ton, representing 26% contribution to MENA region fisheries

The report discusses about the overview of fisheries and aquaculture of the region, and details the potential of sustainable aquaculture development. Environment friendly and sustainable development of Tuna, Seabream, Tilapia and Shrimp farms requires huge investment.

10 Nov, FS&S
14.15 - 14.35
Room 219

Global and national production trends and opportunities and challenges for aquaculture in Australia

Dr Geoff Allan
Industry and Investment NSW
Port Stephens Fisheries Institute, Australia

The proportion of global seafood supplied from aquaculture has grown from less than 10% in the 1970's to nearly 50% today. Production in 2008 was estimated at 68.3 million tonnes (Mt), worth US$106 billion (51.8 Mt excluding

production of aquatic plants). Production from capture fisheries was 90.8 Mt (63.8 Mt excluding production not used for food). Food production from aquaculture and capture was 116 Mt. Aquatic protein is the single most important source of protein in the world but can production meet future demand? If population rises to 9 billion by 2050 (medium estimates from the UN [2008 revision]), the world will need 138 and 159 Mt by 2025 and 2050. If consumption increases at the same rate it has since 1970, the world will need 164 & 232 Mt by 2025 and 2050. With capture fisheries production static the increase will have to come from aquaculture. This will put increasing pressure on available resources and will have a major impact on seafood trade.

The demand and supply of seafood for Australia need to be considered in the context of global demand. Currently, seafood production (capture and aquaculture as "whole fish") in Australia is very small by international standards with 178 thousand tonnes (kt) from capture and 63 kt from aquaculture in 2007/08. Approximately 44 kt of high value product was exported. To meet seafood demand, the majority of seafood consumed was imported; 199 kt in 2007/08. Because the majority is processed (filleted or canned), the equivalent "whole fish" amount imported was approximately 398 kt. Based on current per capita consumption and the mid-point population growth estimates (27.2 and 35.5 million people by 2025 and 2056), Australians will require 760 and 992 kt by 2025 and 2056. This equates to an additional supply of 119 and 351 kt above current supply from capture, aquaculture and imports. If consumption increases to 17.3 kg/capita, Australians will require 938 and 1225 kt by 2025 and 2056 (297 and 584 kt above current supply from capture, aquaculture and imports).

Even in the most optimistic scenario whereby Australia will be able to continue to import most of the fish we eat, increasing global demand means aquaculture production will need to increase to provide some "security" for Australian seafood supply. There are opportunities to achieve this. Australia has abundant marine areas suitable for production, available feed inputs, technical capacity and infrastructure. However, profitability for many existing aquaculture operations is marginal, costs for new ventures are high, obtaining approval is often expensive and risky, labour is relatively expensive and the limited economies of scale, due in part to the small market in Australia, can challenge profitability. To help address these constraints, there is an urgent need for more effective zoning for new developments, renewed, coordinated support and certainty for investors, increased R&D to reduce production costs (particularly for better and cheaper feeds, genetic improvement of key species, improved health management, reduced-cost production platforms, improved post-harvest treatment and supply chain management and improved marketing.

10 Nov, FS&S
14.35 - 14.50
Room 219

Paving the Way for Sustainable Aquaculture Development through Effective Policy Processes

Mark Oliver
Aquaculture Support Services, Sunshine Coast, Australia
Mark completed his undergraduate science degree in 1999 at the University of the Sunshine Coast while working in industry and in 2000 completed his Honours year at the University of Queensland. Mark's Honours research investigated optimising larval rearing techniques of the Sea Mullet Mugil cephalus and the Rabbitfish Siganus nebulosis which had both a practical hatchery component and a molecular focus.

Mark has recently commenced his own business, Aquaculture Support Services, having previously been employed as an aquaculture trainer at the Sunshine Coast Institute of TAFE. Additionally Mark was elected to the Board of World Aquaculture Society-Asia Pacific Chapter and he is aiming to make a marked improvement in the student activities of the Chapter.

Mark obtained support through the Seafood Cooperative Research Centre for his PhD working at the University of the Sunshine Coast with his thesis on 'Paving the Way for Sustainable Aquaculture Development in Queensland's Marine Environment Through Effective Policy Based Decision Making Processes'. The main aim of this project is to determine whether present state and federal marine protection area plans, coastal management plans, regulatory frameworks, existing legislation and their subsequent polices permit sustainable development of commercial marine aquaculture in Queensland when compared with interstate and international norms.
Mark is passionate about aquaculture development within his home state and loves all things aquatic as well as being a self-confessed travel junkie.

10 Nov
13.15 - 16.00
Room 216

Human Behaviour and Communications (HB&C)

Norm Grant
Chair Person
Executive Chairman, Seafood Importers Association of Australasia, Director Seafood Experience Australia Ltd and member of NSW Seafood Industry Conference

How are we going to make Seafood more Exciting and Innovative?

A range of international and local experts from a number of sectors give their opinions – note the speakers may not speak in this order.

10 Nov, HB&C
13.15 - 13.35
Room 216

Training & Education

Brian Wexham
CEO at The Institute (Trade Skills and Excellence) and Director, World Skills Australia

Brian Wexham holds several non-executive board positions which include Creative Communications, The Rock Eisteddfod Foundation, the New Zealand Stage Challenge (Chairman) and the Be Your Best Foundation, South Africa.

Brian Wexham has an extensive background in media and advertising spanning over 30 years. He spent 10 years in London with The Times and Sunday Times in various executive roles.

In 1986 he joined The Observer as a director and was also on the main board of The Today newspaper. He is the author of several books including Shipwrecks and author of an international cartoon strip.

Brian has had international success involving major publishing companies including National Press, South Africa and the International Thompson Organisation. He is the former Chief Executive of Lonrho Media Group PLC East Africa and more recently he was the Chief Executive of APN Educational Media (Australia and New Zealand).

10 Nov, HB&C
13.35 - 13.55
Room 216

Hospitality

Tom Kime
Owner & Operator, Fish & Co, The Sustainable Seafood Café in Annandale, NSW

Tom cut his catering teeth in some of the most famous restaurants in London, including Terence Conran's Le Pont de la Tour, and The River Café. He worked with celebrity chef Rick Stein at the Seafood Restaurant in Padstow, Cornwall, before heading to The River Café for three years.

In 1998 he worked at the award-winning Sydney restaurants Cicada and Darley Street Thai, which was voted one of the top ten Thai restaurants in the world. Under the tutorage of head chef David Thompson. Thus began Tom's quest to discover the secrets of authentic Asian flavours, spices and recipes.

An insatiable appetite for his craft has taken Tom around the world, cooking, teaching, consulting and absorbing the techniques involved in an array of international cuisines. His practical experiences in everywhere from New York to Syria, from Ecuador to Vietnam, have given him a unique perspective on the world of food, which he loves to share.

2009 saw the launch of Tom Kime's Fifth book _Fish Tales published by Kyle Cathie Ltd has been co written with Bart Van Olphen of Fishes in the Netherlands, which is the first sustainable fishmongers in Europe. The book has been written in conjunction with the Marine Stewardship Council MSC.

In Australia, he's probably best known for his appearances on daytime program "Ready, Steady, Cook!" – but in the homeland (being England) he's better known for his four books, two restaurants, assorted television appearances (including one currently on the BBC that he did with Rick Stein) and for cooking Jamie Oliver's wedding.

10 Nov, HB&C
13.55pm - 14.15pm
Room 216

Media

John Sackton
John Sackton, President of Seafood.com and publisher of Seafood.com News

John Sackton has been active in the seafood industry for over 33 years. He is recognized as one of the top seafood market analysts and researchers in the world. In 1994, he founded Seafood.com, to provide market data, foreign trade information, and price forecasts to the industry. His clients have included hundreds of companies and institutions, from the U.S., and Canada, Europe, South America, Russia, and China.

In 1998, he founded Seafood.com News which is now distributed in partnership with Urner Barry Publications. Seafood.com News is a daily electronic seafood news report that is the most widely read seafood industry news service in North America. The website is www.seafoodnews.com.

Through Seafood.com News, John has written extensively about the market impact of the 2004 U.S. tariffs on warm water shrimp, and other market developments in the shrimp industry, including the impact of the BP oil spill in 2010.

He has extensive contacts with both the domestic shrimp harvesters and producers, and the shrimp importers and foodservice distributors opposed to the tariffs. For several years, John has presented shrimp market analysis to the International Shrimp Culture Symposium in Central America.

John does extensive speaking at various conferences and symposiums in both the U.S., Canada, and overseas. For the past six years has provided an overview of the U.S. seafood market and a forecast to the annual Fisheries Council of Canada meeting.

The Seafood.com website is the most heavily visited seafood industry web site in North America, and John's daily seafood industry market email has thousands of subscribers.

John provides a full range of seafood consulting and speaking services in the areas of price forecasting, market analysis, trade analysis, and data services. He has worked directly with hundreds of seafood companies around the world from Canada to Alaska, from Chile to Russia. His experience in Alaska, especially with the whitefish industry, came during his time as General Manager of Baader North America, when high speed Pollock filleting machines were introduced to both factory trawlers and shore plants. John lives and works in Lexington, Massachusetts outside of Boston.

10 Nov, HB&C
14.15 - 14.35
Room 216

Marketing

Sophie Halls-Anning
Senior Advisor – Food & Nutrition, Hill & Knowlton Australia

Sophie is responsible for developing and overseeing strategy and implementation of communication campaigns for Hill & Knowlton's food and beverage clients.

A consumer PR specialist with over 15 year's agency-side experience in brand and product communications in both Australia and international markets, Sophie's true passion is in nutrition consultancy.

She led a team of 10 across four divisions of the agency to successfully launch Australia's first low Glycemic Index sugar, which was a subsequently a finalist in the PRIA Golden Target Awards 2009. Sophie will now head the roll out of the product into global markets via the H&K network. Sophie is actively involved in stakeholder engagement, digital and social media, branding and crisis and issues communications for retainer as well as project-based clients in the nutrition and consumer health arenas. This includes Subway, US Cranberries, Horizon Science, GI Foundation, and The Cancer Council.

Prior to joining Hill & Knowlton, Sophie worked with McDonald's Australia on McHappy Day, as well as product launches and local community awareness programs. She launched bread with benefits for Goodman Fielder, helped Ribena Light appeal to a fashion conscious crowd and secured national TV coverage for Metamucil Fibresure to launch the product to main grocery buyers. Sophie also ran NSW Health's World AIDS Day awareness campaign in 2007, lead consumer and community programs for Bayer and raised awareness of hypertension during National Hypertension Week.

In a former role at H&K London, Sophie worked within the specialist youth division where she was responsible for leading the Global Business Unit for a major Procter & Gamble hair care launch, directing Motorola's consumer PR efforts in EMEA markets through the coordination of 30 individual PR agencies and facilitated high profile sponsorships with celebrities and fashion designers to make Ford more appealing to consumer media and style leaders.

Sophie graduated from Nottingham University in the UK in Sociology (BA Hons) and qualified as a nutritionist in 2008.

10 Nov, HB&C
14.35 - 14.50
Room 216

Producer

Natalie Johnson
Trade Marketing Manager for Tassal Ltd

Natalie has been in the Tassal system for a few years and has been adding experience to her other strong attributes as she aims to get Atlantic Salmon out of the commodity market. Not coming into the seafood industry with any baggage people, like Natalie, have new refreshing ideas and in the world we live nothing must be taken for granted.

Looking for the marketing edge Natalie says 0"We want our consumers to think differently about our salmon. We've just given them a really good reason to eat their way to beautiful skin as well as good health. We're sure this will raise a new topic of conversation amongst our Tassal consumers."

Operating from Melbourne (home of the newly launched Tassal retail shop and seafood café) Natalie is a young person on the rise.

Poster Presentations

from Saturday 6 to 9 November 2010

Posters will be on display in

"The Wonders and Opportunities of our Oceans" Exhibition

A brief review of marine toxins produced by marine organisms and their effect on Human Health	*Ms Mahsa Alidoost Salimi*
Pre-school educational programs on seafood safety and sustainability. Results from a case study.	*Professor Jose Fernandez Polanco*
Immunomodulatory effects of seaweed extract nutrient complex – a combined phase I and II open label study	*Dr JH Fitton*
Incidence of bacterial food borne pathogens in fresh and smoked of Caspian Frisian Roach – Rutilus Frisii kutum	*Mr Mahdi Ghanbari*
Study of chemical and microbial changes on packaged Kilka, using by whey protein edible coating during frozen storage	*Dr Shahla Jamili*
Quantitative evaluation of Rainbow Trout Onchorhynchus Mykiss cultured in brackishwater and freshwater of Yazd Province, at the based on muscle analysis	*Mrs Nassrin Mashaii*
The effect of replacing dietary fish oil with canola oil on fatty acid compostion of Jade Tiger Hybrid Abalone	*Mr Hintsa Mateos*
Toward building a sound seafood health knowledge base in young students	*Mrs Margaret Merga*
The effect of essential fatty acid status on cardiovascular function and cognitive performance	*Ms Laura Sellick*
Sulfated Modification of Lycium Barbarum Polysaccharide under Microwave Irradiation and their Anti-HIV Activities	*Dr Xiaohe Zhu*
Bacterial counts in fresh south-harvested fish while loading in Shiraz	*Dr Parisa Azadnia*

SEAFOOD & HEALTH
INTERNATIONAL CONFERENCE AND EXHIBITION
MELBOURNE CONVENTION EXHIBITION CENTRE
AUSTRALIA 6-10 NOVEMBER 2010

FAO's vision:
A world free of hunger and malnutrition where food and agriculture, including fisheries, contributes to improving the living standards of all, especially the poorest, in an economically, socially and environmentally sustainable manner.

FAO's activities comprise four main areas:
- Putting information within reach
- Sharing policy expertise
- Providing a meeting place for nations
- Bringing knowledge to the field

www.fao.org/fisheries/en

FAO FIAT PANIS

Information

General Information from the Conference Managers Conference Plus Australia Pty Ltd

John Richards – Operations 0407391347
Luba Richards – Registration, Travel, Accommodation for Speakers and Delegates and General Administration 0407 320 852

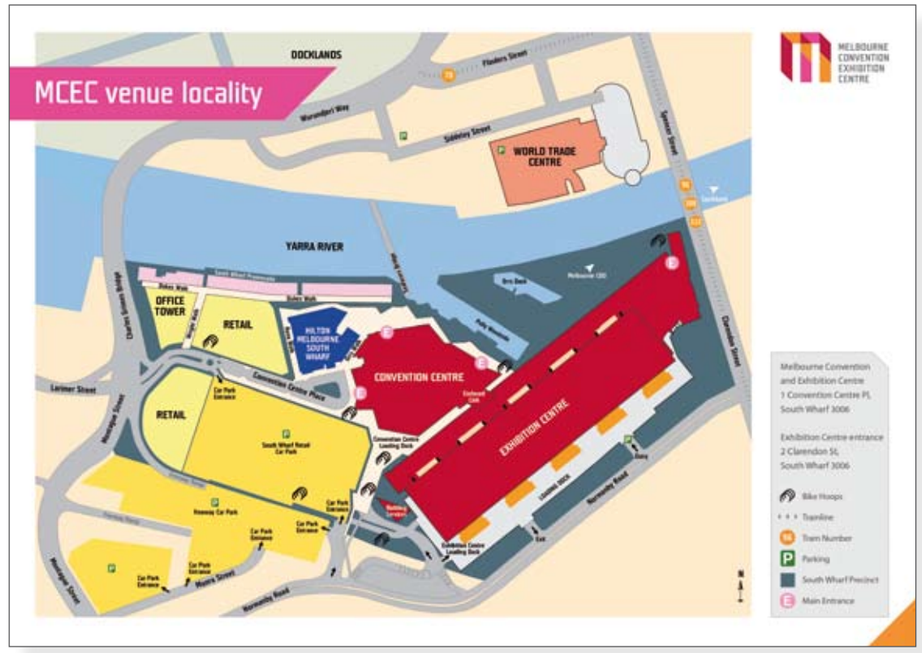
Money conversion information www.conferenceplus.com.au home page

Venue

Melbourne Convention and Exhibition Centre is the largest and most versatile Convention and Exhibition space in the Southern Hemisphere. As the first, and only, ‚6 Star Green Star' environmentally rated Convention Centre in the world, the venue represents world leadership in best practice, innovation and sustainability and continues to raise standards to new heights in technology, imaginative catering and service option and friendly staff.

MCEC

The Melbourne Convention and Exhibition Centre (MCEC) is comprised of the:
Melbourne Convention Centre the location of the International Seafood and Health Conference and the Melbourne Exhibition Centre where the Wonders and Opportunities of Our Oceans Exhibition is being held.
The Melbourne Convention Centre is fully integrated with the Melbourne Exhibition Centre by an enclosed link at Door 6 of the Melbourne Exhibition Centre concourse providing delegates and visitors with easy access when moving around the venue.



Registration Desk

Luba Richards is the manager in charge of the Registration desk team and will be available on the following dates and times:

Sunday	6th November from 3.00pm – 6.30pm
Monday	7th November from 7.30am – 6.00pm
Tuesday	8th November from 7.00am - 5.30pm
Wednesday	10th November from 7.30am – 5.00pm

Notice board

Located near the registration desk.

Parking arrangements

Parking is available for people as well as those with disabilities in the Melbourne Exhibition Centre car park. Disabled parking locations are near entry doors 1, 6 and 10, which have lift access to the concourse and exhibition area on Level 1. To access Level 2 or Level 5, a separate elevator is located behind the customer service desk. Easy access to a taxi rank and the street is via a ramp outside the main Clarendon Street entrance.

Disabled toilets

Disabled toilets are situated behind the customer service desk, and also on Level 2 next to the organisers suites. Inside the exhibition area, toilets are located on either side of the kiosks.

Telephone

A telephone providing ease of use for visitors in wheelchairs is located with our other public telephones on the concourse. A TTV telephone suitable for hearing-impaired people can be found adjacent to the ATMs on the concourse The venue map indicates on- site and nearby parking stations, be aware that there is very little street parking in this part of Melbourne.

Mobile telephones

Out of respect for our presenters please ensure that your mobile communications device is switched off or switched to vibrate during conference sessions. Anyone caught with a ringing phone during any session will pay $5 fee to Aquaculture without Frontiers charity.

Wireless connect

There is a Wi Fi service in the venue for those with laptops equipped with wireless communications.

Melbourne Aquarium
(close by the Venue)

Special discounted entry price of $21 (usually $32.50 for Adults) for all delegates attending the International Seafood and Health Conference. Vouchers are available from the registration desk.

Exhibition

Seafood Services AUSTRALIA

The SSA Welcome & Official Opening of the Wonder and Opportunities of Our Oceans Exhibition
(Tickets to catering are included with each **"Full Registration"** and **"Exhibition Booth Attendee Catering Registration"**), Dress Code: Neat casual

Venue: Melbourne Exhibition Centre Door 8, 6.30pm – 8.30pm
The Welcome is being held in the Wonders of Our Oceans Exhibition on the Celebrity Chef's demonstration stage located at the back right hand corner of the exhibition hall. The Welcome commences at 6.30pm and continues until 8.30pm. Drinks and finger food will be served. Those who advised of their special dietary needs will be catered for. Entry tickets will be collected at the entry to the welcome reception area around the Chef's Celebrity Stage.

Gala Dinner

sea
SEAFOODEXPERIENCEAUSTRALIA

The SEA Gala Dinner (tickets are included with each **"Full Registration"**)
at the Melbourne Convention Centre Ballroom (Room 201) Melbourne (This Venue)

Arrive: 7-00pm for pre-dinner refreshments and be seated by 7.30 pm Tuesday 9th November 2010
The Seafood and Health conference committee cordially invite you to come on-board for the seafood industry "Gala Night of Nights". You will be served a four course dinner of hand picked Australian seafood in a menu created by the Venues Executive Chef Shaun Bowles accompanied with wines and beverages specially selected by the venues Sommelier. The dining room will have an oceanic ambience styled by one of Melbourne leading theming companies.

You can theme yourself too it's a Fish tie or Fishy costume affair. Win a prize for the best Fishy Tie or costume. Our master of ceremonies and the top class entertainment will ensure a "good night will be had by all". Top line acts all night long to which you can dance the night away. Most importantly if you wish to you can escape the band to the foyer while you have your dessert and coffee and a good chat, hurry Tickets are selling fast!

There's more

There will be a table top raffle with proceeds going to **Aquaculture without Frontiers charity**. Major prize is a set of 18ct Yellow gold and diamond long tapered French hook earrings featuring 8 diamonds and a pair of Round 10.5mm "A" grade Australian South Sea pearls of Silver White Pink colour. **Valued at $2300.00**

The Major Prize is donated by Serena Sanders of Sirene Sea Pearls, Proserpine QLD.
This a great opportunity to make up a table from your organisation and come along and enjoy the occasion and make it your 2010 Christmas party and enjoy the fellowship of your industry friends and start the lead up to Christmas.

You can purchase your ticket on line at **www.secureregistrations.com/Seafood&Health/Tickets.cfm**
or at the registration desk for $150.00 per person or $1400.00 per tables of 10.

Daily Conference Catering

Morning tea and coffee will be served on conference days 8th – 10th November. 8th and 9th Morning and afternoon tea and lunch will be served in the Wonders and Opportunities of our Oceans Exhibition in the poster display area it will be necessary to wear your name badge to enter the area. On the 10th conference food service will be on the second floor of the convention centre in the foyer area opposite room No's 212 & 13.

Room numbers

Gala Dinner: Room 201
Public Forum & Plenary: Room 212 & 213
Breakout 212 & 213: Health, Nutrition and Medical Science & Research
Breakout 219: Food Security and Sustainability
Breakout 216: Human Behaviour and Communications

Smoking Policy

by legislation smoking is banned in public buildings, hotels and bars.

Transfer

Transfer to the airport after the conference: You can organise your airport shuttle with Skybus at the front desk of your hotel. The cost is minimal and the service is reliable. Local knowledge indicates that finding taxis late afternoon may be difficult therefore we suggest you book the service which you opt for with the reception of your hotel well in advance. Upon checking out of your hotel ask your hotel concierge to store your luggage for collection following the conference and book your pick up from the hotel.

Taxi Service

Melbourne Silver top can be reached on 131008, Example of charges $3.20 when meter has started
Distance: $1.617 per kilometer
Detention: $0.566 per minute while vehicle speed is below 21 kph
Extras: Entered on meter at start of trip when applicable
Phone Booking: $2.00 entered on the taxi-meter at the start of the trip
Late Night Surcharge: 20% surcharge applies to all hiring's which commence between midnight and 5.00 am and is automatically calculated and displayed on the taxi-meter
Multiple Hiring: is allowed with the consent of the first and subsequent hirers.
Each Hirer pays 75% of the fare shown on the meter at the end of their particular section of the trip.

Hotels contact details

Hilton South Wharf, South Wharf Melbourne: +61 3 9027 2000
Crowne Plaza Hotel, 1-5 Spencer Street Melbourne: +61 3 9648 2777
Crown Metropole, 8 Whiteman Street Melbourne: +61 3 9292 8888
Crown Promenade, 8 Whiteman Street Melbourne: +61 3 9292 6688
Crown Towers, 8 Whiteman Street Melbourne: +61 3 9292 6688
Medina Executive Northbank, 550 Flinders Street Melbourne: +61 3 9246 0000
Pensione Hotel, 16 Spencer Street Melbourne: +61 3 9621 3333
Batman Hill Hotel, Cnr Collins & Spencer Street Melbourne: +61 3 9614 6344
The Langham Melbourne, One Southgate Avenue: +61 3 8696 8888
Hotel Enterprize, 44 Spencer Street Melbourne: +61 3 9629 6991

In case of a medical or dental emergency

Dr Jack Acheson
World Trade Medical Centre Cnr Flinders & Spencer Sts Melbourne opposite the convention centre
Telephone +61 3 9614 6555

World Trade Centre Pharmacy
Corner Spencer & Flinders Streets Melbourne
Telephone +61 3 9620 2200

If emergency medical attention is required call **Police and Ambulance 000**

Handy websites

http://www.seafoodhealthconference.com
http://www.visitmelbourne.com

Disclaimer of Liability

The host body and organising committee, their agents and their servants act as only organisers of the activities and do not accept any responsibility for an act, accidents or omissions on the part of service providers.

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The event organisers reserve the right to amend any part of the program without notice. Such amendments may include substitution or cancellation of speakers or tours.

While it was originally intended to have photographs of each presenter in this program booklet we were unable to gather everyone's photographs in the correct resolution to present them in a professional manner.

www.seafoodhealthconference.com

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visitmelbourne.com

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