

Welcome you to the

The 2nd Annual Food Industry Forum for Nutrition Research



Sustainable Nutrition - Sustainable Lifestyles

Monday 29th - Tuesday 30th August 2011
The Sebel Playford, 120 North Terrace, Adelaide

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Welcome

Dear Participants,

On behalf of our co-hosts and program committee, I would like to welcome you once again to Adelaide for the 2nd Annual Food Industry Forum for Nutrition Research.

Following the outstanding success of the inaugural forum last year, we were encouraged by our enthusiastic participants and sponsors to establish the forum as an annual event.

This year, we have developed a program around the topical theme of sustainability, focusing on nutritional requirements for sustainable healthy lifestyles and how they might be delivered in a sustainable environment; we have attracted an impressive selection of Australian and New Zealand researchers and opinion leaders to address these issues.

While our food industry endeavours to be responsive to concerns about food security and availability in an increasingly populated world with diminishing resources and major environmental threats, we also expect it to meet the increasingly demanding nutritional standards of an aging population that recognizes the importance of adopting and maintaining healthy lifestyles. However, as will be discussed in the program, these expectations are not mutually exclusive. There are many examples where healthy lifestyles and environmental stewardship go hand in hand. We need to identify opportunities to apply this philosophy to our food supply to ensure that it continues to meet the nutritional requirements of a healthy population in an economic and environmentally sustainable fashion.

I trust that you will once again enjoy the presentations and the opportunity to network with colleagues and will profit from your participation in the forum. We look forward to seeing you again next year.

Finally, I wish to thank all the sponsors of this year's forum for their generous support.

Peter Howe

Convenor

On behalf of the organizers and program committee:

Jon Buckley, Alison Coates, Manohar Garg, Geoffrey Annison, Leisa Ridges, Katrine Baghurst, Anne Jurisevic, Tanya Vernik.

Program

Monday 29 August

5.30pm: REGISTRATION
Sebel Playford - Level 1, ballroom 3

6.00pm: Official Welcome & Opening - Hon John Hill MP, Minister for Health

6.10pm: Paul Nestel Lecture
Professor Tony McMichael
Sustainable Nutrition - Sustainable Paths, and Challenges, for the Food Industry

7.15pm: Australian Food & Grocery Council Dinner
Sebel Playford - Level 1, ballroom 2

10.00pm: CLOSE

Tuesday 30 August

8.00am: REGISTRATION
Sebel Playford - Level 1, ballrooms 1&2

8.45am: Welcome

Nutrition for Life - *Sponsored by Nestle*

- 8.50am Dr Karen Campbell: *Nutritional programming - setting sustainable patterns*
- 9.20am Dr Alison Hill: *Eating for everyday active lives*
- 9.40am A/Prof Vicki Flood: *Seeing is believing -the case for carotenoids*
- 10.00am Dr Lisa Wood: *Cool nutrients - counteracting inflammation*
- 10.20am Dr Nathan O'Callaghan: *Dining out with your DNA? Tailoring nutrition to fit your genes*
- 10.40am Prof Andrew Scholey: *Foods for moods and minds*

11.00am: Morning Tea/coffee

Foods for Sustainable Nutrition - *Supporting Sponsors*

- 11.30am Dr Rosemary Stanton: *Sustainable foods and good nutrition -a new union*
- 12.00pm Prof Peter Clifton: *Saturated fat - how low do we need to go?*
- 12.20pm Prof Nick Costa: *Red meat - hard to beat?*
- 12.40pm Prof Jonathan Hodgson: *Legumes - good for the pulse?*

1.00-2.00pm: Lunch

- 2.00pm A/Prof Jon Buckley: *Fast food - dairy shows the whey?*
- 2.20pm Prof Peter Howe: *omega-3 requirements - length matters!*
- 2.40pm Dr Peter Nichols: *long-chain omega-3 sources in a resources constrained world*
- 3.00pm Prof Robert Scragg: *Sustainable nutrition - do supplements do it better?*
- 3.30pm Prof Tony Worsley: *Consumers and food - sustainable what?*

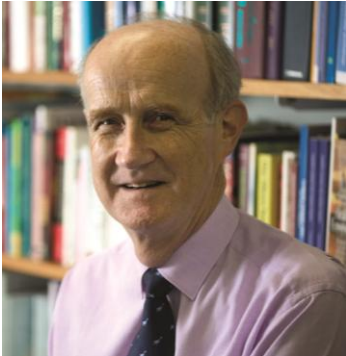
4.00pm: Closing Summary

Food Industry Forum for Nutrition Research 2011 Program Committee: Peter Howe (Convenor)
Jon Buckley, Alison Coates, Geoffrey Annison, Manohar Garg, Leisa Ridges, Katrine Baghurst

Speaker Bios & Abstracts

Professor Tony McMichael AO

National Centre for Epidemiology and Population Health, Australian National University



Tony McMichael, medical graduate (Adelaide University) and epidemiologist, holds a 5-year NHMRC Australia Fellowship at the Australian National University, Canberra. He was previously Professor of Epidemiology at the London School of Hygiene and Tropical Medicine, 1994-2001, and subsequently was Director of the National Centre for Epidemiology and Population Health at the Australian National University. In 2008 he was appointed Honorary Professor of Climate Change and Health at the University of Copenhagen. In 2009 he was elected an Honorary Fellow of the London School of Hygiene and Tropical Medicine. He was President of the International Society for Environmental Epidemiology during 2008-2009.

During the ten years that he headed the Epidemiology Research Group within the CSIRO Division of Human Nutrition, in Adelaide, Tony McMichael (TMcM) developed a wide-ranging interest and research engagement in relation to dietary and metabolic influences on disease processes and risks. He has had a longstanding academic and research interest in the dietary and other influences on biological evolution - and how these relate to risks of disease in contemporary settings. This has included work on the genetic modulation of cancer risk associated with meat consumption, on the phenotypic differences (and their origins) that influence the occurrence of Type 2 diabetes,^{4,5} and on the role and use of molecular genetic measures in epidemiological research. In recent years TMcM has continued his active interest and writing in relation to the inter-relations between food systems, environmental sustainability, human biology and risks to health⁶ - including further interests in aspects of meat consumption and dietary-hormonal influences on cancer risk.

TMcM has been a pioneer in, and remains central to, the development and implementation of research into the health risks and impacts due to global climate change and other large-scale environmental changes. During 1993-2006 he played a leading role in health risk assessment for the UN's Intergovernmental Panel on Climate Change. During 2001-2004 he led the (WHO-based) international project estimating the burden of disease and premature death attributable to climate change, both current and to 2030. He co-edited the first methods-based textbook on this topic (Martens & McMichael, Cambridge UP, 2001).

Prof McMichael leads the program of environmental health research at NCEPH, ANU. In 2002 he initiated a program of innovative studies on the interplay of solar ultraviolet, infectious agents, genes and immune-system biology in the aetiology and progression of autoimmune disease (esp. multiple sclerosis). This research interest built on his co-authored paper (McMichael and Hall, *Epidemiology*1997) hypothesising a role for immuno-suppressive UV radiation in autoimmune disease aetiology.

His ANU team's rapidly-expanding research on climate change and health includes, in particular, a set of multidisciplinary studies on 'Drought, Drying and Rural Health Impacts'. Other research activities on climate change and health include climatic influences on Ross River Virus disease, the health impacts of heat-waves, and scenario-based modeling of future (selected) climate-related health risks in Australia. Working with WHO's Tropical Diseases Research Program, he chairs an expert Reference Group on Environment, Climate, Agriculture and the Diseases of Poverty.

Abstract

Sustainable Nutrition - Sustainable Paths, and Challenges, for the Food Industry

The word 'sustainable' is now widespread, and widely misused. The food industry in Australia should strive to sustain four things:

1. The environmental resource base from which all food derives
2. The health gains achieved in western societies over two centuries, substantially due to gains in food yields, quality and safety
3. Its own reputation as a responsible social and environmental citizen, attuned to the needs of the future
4. The viability and (reasonable) profitability of its business

This presentation dwells little on items 3 and 4. Item 3 is implicit in the arguments made. Item 4 notes the natural tension between public goods and private goods (profit) - evident, currently, in manoeuvres by many major companies to sidestep the overdue (and inevitable) price-reckoning with the biosphere, including climate. We must all adjust now to this reckoning. The Big Message here (item 1) is that we humans are unavoidably approaching the end of an era of massive non-renewable energy subsidisation, high-impact industrial expansion and population growth. That mix of technological development and economic growth has delivered great benefits to modern societies - though not to many other countries. But it is simply not sustainable. We are operating, globally, at around 140% of Earth's vital capacity.

No-one sensible in the private sector would attempt to run a business on an ever-increasing large over-draft - even if their bank would accommodate it. In today's global-environmental case, the planet cannot accommodate it. Hence the change in global climate, declining soil fertility, depletion of freshwater stocks, environmental nitrification, ocean acidification, and biodiversity losses (some, probably more than we recognise, important in food production). This great issue cannot be ducked indefinitely. The World Bank's 'International Assessment of Agricultural Science, Technology and Development' (2007) concluded that much of our agriculture (including livestock production) is at a critical crossroads - and this without factoring in the substantial increase in drought conditions (interspersed with flooding) anticipated from climate change. In many respects, Australian agriculture is particularly vulnerable.

Meanwhile, there remains an unresolved public argument about what role the food industry should play in sustaining the nutritional quality of Australia's diet. This issue should not be consigned to the realms of: (i) identifying genes that (putatively) can be tweaked to aright personal metabolism, (ii) developing 'functional foods' as alternatives to simple wholesome foods, (iii) buck-passing responsibility to free-range consumers to look after their own nutritional health. Obesity, and its health and economic consequences, have increased recently; yet neither population genetic profile nor basic human nature have changed. Something else in our daily living, marketing and consuming environment has changed. We have come far from proto-agrarian initiatives by the Natufians (northern 'Syria') 13 millennia ago. Our recent ancestors made food supplies more secure in the 17th-19th centuries. However, now we risk having come too far - too many people, too much energy-intensive farming, too many processed and snack foods pandering to a taste preference (fats, salt and sugars) that, originally, aided survival during human prehistory. And, still, too little readiness to transform how we live, produce and eat, such that future generations may do likewise. We too are ancestors.

Markets foster efficiencies, creativity and, hence, profits. The emerging transformative ('sustainability') pressures on the food system, from society at large, will create great opportunities to develop improved, lower-footprint, health-supporting modes of production, processing and marketing. That way lie both future sustainability and profitability.

Notes

Dr Karen Campbell

Centre for Physical Activity and Nutrition Research, Deakin University



Karen Campbell is a Senior Researcher in the Centre for Physical Activity and Nutrition Research at Deakin University in Melbourne, Australia. With a background in dietetics and health promotion Dr Campbell undertook her Masters in Public Health and then a PhD which focussed on home environment correlates of young children's eating behaviours. Karen conducted the first Cochrane systematic review of obesity prevention in children in 2002 to better understand what worked in obesity prevention but also to highlight how underserved this important area was. She continues to update this review biannually. Her intervention research focuses on the continuum of opportunities for obesity prevention between pre-pregnancy and early childhood. She has just completed the intervention phase of The Melbourne Infant Feeding Activity and Nutrition Trial (InFANT) Program, an obesity prevention intervention targeting first time parents in their existing social groups, from child age 3-18 months. This cluster RCT has involved around 550 families in 62 first-time parent groups across Melbourne, Victoria.

Abstract

Nutritional Programming, Setting Sustainable Patterns

Children's diets fall well short of dietary guidelines. Public health approaches to promoting children's healthy eating remain piecemeal and only partially informed by our understandings of capacities to influence child diet. While a focus on public policy is fundamentally important, to be maximally effective policy needs to acknowledge the ways in which children develop food preferences, eating behaviors and in the turn dietary patterns that will persist across the lifecourse.

Evidence suggests a focus on women's diets prior to and throughout pregnancy is important for both maternal and child health. A child's food preferences and potential for overweight may be impacted by maternal diet in utero, by BMI pre-pregnancy, by excess weight gain across pregnancy, and by breastmilk exposure. A child's diet will also be influenced by the environment in which they learn to eat. Children's diets are predicted by parental: nutrition knowledge and attitudes to health; self-efficacy; feeding practices; modeling of eating and home food availability. Recent Australian research shows that public health approaches can significantly improve maternal and child dietary patterns when delivered early post-partum.

Given that diet tracks moderately across the lifecourse, the foods young children learn to prefer confers both nutritional and environmental consequences over many years. The potential of parents to influence both diet and environment - motivated by their desire to provide the best for their child - has great unmet potential. Parents have profound capacity to impact children's behavioral trajectories, and to advocate for and endorse broad reaching social policy that will support their desire to raise healthy children.

Notes

Dr Alison Hill

Nutritional Physiology Research Centre, University of South Australia



Alison Hill is a newly appointed nutrition lecturer at the University of South Australia with a joint research appointment in the Nutritional Physiology Research Centre. With first class honours in Human Movement from the University of South Australia, Alison undertook her PhD at the University of Adelaide, evaluating the combined and independent effects of exercise and omega-3 supplementation on cardiovascular risk factors, which led to further investigation of the anti-obesity potential of omega-3. She commenced her postdoctoral research in 2007 at the prestigious Nutrition Dept of Pennsylvania State University, where she conducted numerous controlled clinical interventions primarily in the area of cardiovascular nutrition.

Abstract

Eating for Everyday Active Lives

Eating every day is easy. The challenge is what to eat and how to be active. Most developed countries have established dietary and physical activity recommendations to guide healthy individuals in their lifestyle choices, with the overall goal of promoting good health and preventing the onset of diet-related chronic disease. Both Australia and the United States have a history of providing evidence-based nutrition information to the public, which is currently translated into food based guidance through *The Australian Guide to Healthy Eating* and *MyPlate* (formerly *MyPyramid*). The focus of this information has changed over time. Dietary guidelines originated as a means to alleviate diseases of deficiency, yet they now encompass recommendations that address problems of dietary “sufficiency”. The principles guiding dietary recommendations are that they are for a healthy population, yet the prevalence of overweight and obesity is rising. Considering that over 60% of adult Australians are overweight or obese, is it reasonable to assume that our population is “healthy”? The latest dietary guidelines in the United States place a clear emphasis on consuming a dietary pattern that promotes overall health *and* addresses obesity related cardiovascular risk factors, such as low density lipoprotein cholesterol and hypertension. Specifically, the *2010 Dietary Guidelines for Americans* emphasise a plant-based total diet approach that is low in sodium, added sugars and solid fats and rich in nutrient-dense foods such as fruits, vegetables, whole grains, lean meats, fish, nuts and reduced-fat dairy. These components are consistent with dietary recommendations for primary and secondary prevention of cardiovascular disease.

Notes

A/Professor Vicki Flood

School of Health Sciences, University of Wollongong



Vicki Flood is an Associate Professor in Public Health, from the School of Health Sciences, University of Wollongong. Vicki has a background in nutrition and epidemiology and currently conducts research on a wide range of population-based projects, including cohorts and intervention studies. Areas of particular interest include: lifestyle factors associated with healthier outcomes among older people, including eye disease; food access, availability and food security; interventions to reduce chronic disease among children and adults; and supporting indigenous health research. Vicki has published over 60 peer-reviewed journal articles and reviews grant submissions for government and non-government organisations.

Abstract

Seeing is believing - the case for carotenoids

With an ageing population it is increasingly important to consider how to reduce the risk of a major cause of blindness, age-related macular degeneration (AMD). Early AMD has a prevalence of approximately 4% among older people, and doubles to up to 8% with increasing age. Previous randomised controlled trials conducted among people with early signs of AMD have shown that progression of the disease can be reduced by about 35% among people who take a supplement of antioxidants (including carotenoids) and zinc. More recent findings from population-based cohorts have indicated that people consuming a higher quality diet, have a reduced risk for developing AMD. In a population-based longitudinal cohort of older Australians, the Blue Mountains Eye Study, with baseline data collected since 1992-94 (n=3654) up until 2007-2009, we have found several dietary factors reduce the risk of AMD: people who consumed more vegetables, in particular higher consumption of the carotenoids lutein and zeaxanthin, had a 35% reduced risk for AMD; people who consumed more fish and omega-3 polyunsaturated fatty acids had a 30% and 50% reduced risk of AMD, respectively; people who included 1-2 serves of nuts had a 35% reduced risk of AMD; people who had very high zinc intake had a 44% reduced risk of AMD; and people who consumed diets in the highest quintile of mean Glycemic Index had a 77% higher risk of AMD. It is important to consider sustainable public health strategies which support the consumption of high quality diets as people age.

Notes

Dr Lisa Wood

School of Biomedical Sciences and Pharmacy, University of Newcastle



Lisa leads the Nutrition programme within the Centre for Asthma and Respiratory Diseases, University of Newcastle. She is a nutritional biochemist, who has been working in the area of nutrition and inflammation for over 10 years. Her PhD studied the relationship between antioxidants and oxidative stress in respiratory disease, in particular cystic fibrosis (CF). This work has led to significant progress being made in understanding oxidative stress in CF, with dietary fat being identified as an important factor determining the extent of oxidative damage. From 2002-2006, she undertook a postdoctoral fellowship (NHMRC Australian Training Research Fellowship), in the Respiratory Research Group, Hunter Medical Research Institute, Newcastle. Throughout this fellowship, she continued her research on dietary factors influencing respiratory diseases, in particular asthma. She undertook a comprehensive evaluation of antioxidant defences in asthma and identification of imbalances in the oxidant/ antioxidant system in asthma. The status of tocopherols,

carotenoids and glutathione were determined to be disturbed in asthma. This led to the filing of a provisional patent and the development of an intervention strategy, which has been supported by the award of an NHMRC project grant (2005-2008) studying the effects of lycopene supplementation in asthma. In 2007, she was awarded a Brawn postdoctoral fellowship at the University of Newcastle and during this time, she has extended her work to investigate the roles of dietary fat and obesity as promoters of airway inflammation. She was awarded an NHMRC grant (2008-2010) to develop this area. In 2010, Dr Wood took up an academic position in the School of Biomedical Sciences, University of Newcastle, in which she combines both research and teaching responsibilities.

Abstract

Cool nutrients - counteracting inflammation

The term 'metaflammation' (metabolically triggered inflammation), describes a state of chronic low-grade inflammation, principally triggered by nutrients and metabolic surplus. Acute inflammation is a necessary and reparative response to tissue injury. However, the long-term consequences of inflammation are often not beneficial and may lead to the development of metabolic diseases.

Features of a westernised diet that contribute to increased inflammation include low antioxidant and fibre intake, high saturated fat and refined sugar intake and chronic metabolic surplus with resultant obesity. Antioxidants protect against oxidative stress by scavenging free radicals, thereby preventing cell damage and dampening inflammation. This capacity is reduced when a low antioxidant diet is consumed. Dietary fibre also induces an antiinflammatory response, stimulated by the short chain fatty acids (SCFA) that are produced by fermentation of dietary fibre by microbiota. This antiinflammatory effect is absent in a low fibre diet. A high saturated fat intake can enhance inflammation, as the body 'senses' fat molecules and responds as if they were invading bacteria. Chronic nutrient excess also contributes to inflammation, as excess energy is stored as adipose tissue, leading to obesity. Adipose tissue is metabolically active and releases proinflammatory mediators, which further contribute to the inflammatory milieu.

Therapeutic strategies targeting diet-induced inflammation are warranted, as increased systemic inflammation increases the risk of various metabolic diseases that cluster together, such as cardiovascular disease and diabetes. We have also been examining the role of diet-induced inflammation in the development and progression of asthma.

Notes

Dr Nathan O'Callaghan

CSIRO Division of Food and Nutritional Sciences



Nathan O'Callaghan currently works at CSIRO in the Division of Food and Nutritional Sciences in Adelaide. Our group, Nutritional Genomics, is working on Diagnostics and dietary prevention of genome damage in an effort to reduce developmental and degenerative disease within the Australian population. I specifically work on telomere shortening and telomere dysfunction and aim to: 1. develop novel and better techniques for measuring damage to telomeres on chromosomes in accessible human tissue; 2. identify which nutrients and dietary patterns are essential for telomere length maintenance *in vivo*. This research will contribute to the discovery of biomarkers of health and disease and enhance prospects of indentifying which nutrients, dietary patterns and lifestyle factors are essential for telomere maintenance to maximise health outcomes.

Abstract

Dining out with your DNA? Tailoring nutrition to fit your genes.

The shift from health to disease in any individual is characterised by a general reduction in physiological efficiency and function, resulting in homeostatic imbalance that leads to morbidity and eventual mortality. Everyday, every individual's homeostatic balance is constantly being compromised as a result of environmental insults. Therefore it is of paramount importance to health and well being that organisms, tissues and cells are able to respond appropriately, efficiently and effectively to these everyday environmental stressors; Our DNA (or genome) is susceptible and sensitive to these environmental stressors.

It is becoming increasingly evident that risk for developmental and degenerative disease, including cancers, increases with more DNA damage. Importantly, DNA damage is influenced by, and can be modified by, nutritional status. Optimal concentrations of nutrients for reduction of genome damage are also dependent on many factors (genetic background, age, nutrient uptake) that vary from individual to individual.

Here I will give an overview of how we are using our knowledge of genomics and genetics to understand how nutrition modifies disease risk. Furthermore I will discuss how we are applying this biological information to understand an individual's response to foods and food components. This will enable us to tailor nutrition to improve health and wellbeing for that individual.

Notes

Professor Andrew Scholey

Brain Sciences Institute, Swinburne University



Andrew Scholey is a leading international researcher into the neurocognitive effects of natural products, supplements and food components, with over 100 peer-reviewed journal articles and book chapters. He is Professor of Brain and Behavioural Sciences at the Brain Sciences Institute (BSI), Swinburne University, Melbourne and is director of their Herbal and Nutritional Medicine Research Unit and co-director of the NICM Collaborative Centre for the Study of Natural Medicines and Neurocognition. In 1998, he established the Human Cognitive Neuroscience Unit at Northumbria University, UK and was the Unit's director until joining the BSI in 2007. Professor Scholey was also co-director of the UK's Medicinal Plant Research Centre and remains as honorary director of Neurocognitive trials. Andrew has been lead investigator in a series of landmark studies into the human biobehavioural effects of

natural products, and their neurocognition-enhancing and anti-stress/anxiolytic properties. These include first-into-human, placebo-controlled trials evaluating *Panax ginseng*, *Panax quinquefolius*, *Melissa officinalis*, *Salvia officinalis*, *Salvia lavandulaefolia* and guaraná. These were sufficiently rigorous to merit publication in high impact mainstream psychopharmacology journals and have been widely cited. He has attracted millions of dollars in research funding, including as Chief Investigator on national competitive grants from the UK, Europe and Australia as well as from many industry bodies in Europe, North America, Asia and Australia.

Abstract

Foods for moods and minds

As the ageing population increases so does the prevalence of age-related cognitive decline and dementia. Nevertheless, neurocognitive ("brain and mind") health belongs to a cluster of interrelated processes which may be modifiable through dietary interventions. Over the past decade or so there has been a huge amount of progress in our understanding of the effects of nutritional interventions (including dietary supplements) on mood and cognitive function. This talk will discuss issues and challenges in this field, including brief discussion of methodology to capture the effects of nutritional interventions on behavioural outcomes and relevant biomarkers. Results will be presented from specific double-blind placebo-controlled intervention studies. In general several botanical extracts have behavioural effects which are in keeping with their traditional role. For example *Salvia* (sage) has been extolled for centuries for its memory-enhancing properties and these have been verified in a series of controlled trials. Similarly *Melissa officinalis* (Lemon balm) is capable of improving mood and relieving stress induced in the laboratory. Data will also be presented showing benefits to intense cognitive processing from cocoa polyphenols, and from recent studies indicating that switching to a Mediterranean diet improves mood within days.

Some caution should be taken in generalising these studies. In particular there are issues pertaining to dose relationships, distinguishing between immediate and long-term effects and standardisation of interventions. Nevertheless there may be a future role for dietary interventions in offsetting age-related cognitive decline and even in the treatment of pathologies associated with poor mood and cognitive functioning.

Notes

Dr Rosemary Stanton OAM

School of Medical Sciences (Visiting Fellow), University of New South Wales



Dr Rosemary Stanton OAM has been involved in public health nutrition, education and consumer issues relating to nutrition for 45 years. She is a Visiting Fellow in the School of Medical Sciences at the University of New South Wales and is involved with the Institute for Sustainable Futures at the University of Technology (Sydney) in their international work on sustainable use of resources in food production, the University of Adelaide's Food Futures program and is an invited member of the Scientific Committee for Doctors for the Environment. Rosemary has authored many scientific papers, 32 books on food and nutrition and writes for newspapers and magazines for the public and the medical profession. Her current interests focus on the interrelationships between healthy diets and environmental factors related to climate change.

Abstract

Sustainable foods and good nutrition - a new union

It is not difficult to get people to change their eating habits. Travel can do it. The food industry has done it so well that most Australians now eat quite differently from earlier generations. Nutritionists have had less success in encouraging healthier eating habits. Perhaps a new perspective would help. Rather than talking about the need to lose weight or eat less fat or sugar, let's talk about eating in a way that is good for the health of the planet. A diet based on principles of environmental sustainability is remarkably close to the diet we recommend for health.

The carbon footprint may be a better motivator than the calorie. A new perspective offers opportunities for cross-fertilisation of ideas. Agricultural scientists can exploit soil biology and develop nutritious plants that require less of the world's diminishing stocks of phosphate fertilisers. They can boost aquaculture sustainably and devise ways to recapture nutrients. Farmers can produce more environmentally-appropriate animals and grow some of the thousands of plant foods currently less familiar to Australians. The general public (let's ditch the passive term 'consumers') can be encouraged to reduce waste (and waist) by buying only what they need, choosing fresh foods in season, drinking tap water, minimising foods with little, no or negative effects on health. We can all grow or support community and school garden programs. The processed food industry can assist with developing carbon footprint labelling and using their skills to assist with healthier and more sustainable choices. A sustainable future depends on changing our outlook - let's go for it.

Notes

Professor Peter Clifton

Baker IDI Heart and Diabetes Institute



Peter Clifton worked for CSIRO for 22 years before moving to Baker IDI in July 2009. He has a strong interest in obesity, type 2 DM, cardiovascular disease and hyperlipidemia. He is a physician looking after patients with these conditions and is co author of the CSIRO Total Well Being diet Books 1 and 2, The Healthy Heart Book and the CSIRO Baker IDI Diabetes Book.

Abstract

Saturated fat: how low do we need to go?

Saturated fat has been regarded as one of the prime harmful dietary components that increase the risk of heart disease. All Heart Foundations around the world recommend reduction of saturated fat. This belief has been challenged by a meta analysis of cohort studies from the Krauss group that showed no relationship between saturated fat intake and heart disease (an insignificant 7% increase). However the result was not entirely a surprise given that a 10% change in saturated fat intake would lead to a 0.4 mmol/L change in LDL cholesterol. Based on the intensive statin studies this should lead to a 7-8% reduction in events which would be impossible to detect in an epidemiological study. Replacing saturated fat with polyunsaturated fat modestly lowers coronary heart disease risk, with about a 10% risk reduction for a 5% energy substitution; whereas replacing saturated fat with carbohydrate has no benefit. Intervention studies show a clear benefit when saturated fat is replaced by polyunsaturated fat -whether omega-6 fat is equally beneficial to omega-3 fat is in dispute at present.

Notes

Professor Nick Costa

School of Environmental Science, Murdoch University



Nick Costa was appointed to the inaugural Chair in Sustainable Agriculture and Dean of the School of Environmental Science at Murdoch University in 2005. Professor Costa graduated with first class Honours in Agricultural Science in 1973 and PhD in 1977 from The University of Adelaide. Professor Costa has held appointments in biochemistry and nutrition at Murdoch University's School of Veterinary and Biomedical Science from 1977 - 2005. He was also Honorary Editor of the Nutrition Society of Australia (NSA) from 1989 - 1993 and Vice-President of the NSA from 1997-1999. He was the Australian representative on the International Parent Committee for Trace Elements in Man and Animals from 1992 - 2002. Since 2007, Professor Costa has been the Chair of Meat & Livestock Australia's National Environment Advisory Panel. He is the author or co-author of more than 130 scientific publications including 2 books on mineral metabolism in animals.

Abstract

Red Meat - Hard to Beat

Red meat is an efficient and very palatable source of nutrients in the diet of the majority of Australians. Efficiency is an underdeveloped notion in the framework of sustainability. Indeed, efficiency can be inferred in the four pillars of sustainability: environment, economics, society and social justice. This presentation will focus firstly on the nutritional efficiency of red meat, the major source of protein (about 20%) in the Australian diet, in the context of Australian and New Zealand dietary recommendations. Moreover, in terms of nutritional efficiency, protein in red meat is highly digestible, providing an excellent source of essential amino acids as well as being the major source of bioavailable micronutrients such as iron and zinc, all of which are beneficial for growth, cognitive development, and well being in a sustainable diet.

The other focus of this presentation will be how red meat conforms to the four pillars of sustainability. Economically, Australian agricultural supply chains for beef and lamb are recognised for their efficiency, safety, and security of food supply. Socially, these supply chains are important to the resilience of rural communities in Australia, particularly northern Australia. Environmentally, cattle and sheep occupy a unique ecological niche in converting grasses to food for humans. In terms of social justice, Australia is the biggest exporter of red meat in the world, a key contribution to food security and environmental offsets in Australia's region. Thus this presentation will argue that red meat can meet the four pillars of sustainability in a nutritionally efficient manner.

Notes

Professor Jonathan Hodgson

School of Medicine and Pharmacology, University of Western Australia



Jonathan Hodgson is currently an NH&MRC Senior Research Fellow at University of Western Australia in the School of Medicine and Pharmacology. He has a range of research interests including understanding how dietary polyphenols can reduce the risk of cardiovascular disease, and investigating the effects of dietary macronutrients on measurements related to heart health. He has more than 80 peer-reviewed publications, many of which have direct relevance to strategies employed by the food industry for the development of functional “heart healthy” foods. Recent research has involved exploring the potential for grain legumes (pulses) to have positive effects on obesity, diabetes, blood pressure and other cardiovascular disease risk factors. Much of this research has involved conducting randomised controlled trials to exploring the potential health benefits of incorporating lupin flour into the diet. Lupin flour is a novel food ingredient rich in

protein and fibre which contains almost no starch. The lupin trials were conducted within the Centre for Food and Genomic Medicine, a Western Australian Government funded centre.

Abstract

Legumes - good for the pulse

The edible seeds of leguminous plants are known as grain legumes or pulses. The inclusion of grain legumes in crop rotations is an essential component of the long-term sustainability of cereal (primarily wheat) production in Australia. There is also evidence that pulses make a positive contribution to human health. Pulses can provide protein, low glycemic index carbohydrate, resistant starch, and soluble and insoluble fibre to the diet. Despite these positive health attributes, the intake of pulses remains low in many countries including Australia. One approach to increasing the intake of pulses is to develop novel pulse-derived ingredients which can be incorporated into commonly consumed foods in the population. Lupin flour is an example of such an ingredient. Lupin flour is rich in protein (~40%) and dietary fibre (~30%), and contains almost no starch. It can be incorporated into high carbohydrate foods such as bread to significantly increase protein and fibre and reduce the refined carbohydrate content. During the past 5 years we have performed five randomized controlled trials to investigate the effects of lupin-enriched foods on outcomes related to obesity, type 2 diabetes and cardiovascular disease. Results of these trials demonstrate that lupin can significantly reduce appetite and attenuate post-meal blood glucose and insulin responses acutely, and improve insulin sensitivity and lower blood pressure with long term regular consumption. Our results indicate potential benefits of lupin-enriched foods for the prevention and management of type 2 diabetes and obesity. These foods may also provide a simple dietary approach to reduce blood pressure and risk of cardiovascular disease.

Notes

A/Professor Jon Buckley

Nutritional Physiology Research Centre, University of South Australia



Jon Buckley is Director of the Nutritional Physiology Research Centre at the University of South Australia. His research addresses the effects of nutrition and exercise on cardiometabolic and mental health. His research findings have contributed to the development of patents for a number of new nutritional products and he has worked with government to influence nutrition policy in Australia to improve the health of the food supply. Jon also has an interest in nutrition and exercise strategies for improving the performance of elite athletes, and has been working with industry and the Institute of Sport to develop sports nutrition products that can improve athletic performance and to refine testing and training programs for some of Australia's best athletes.

Abstract

Fast food - dairy shows the whey?

Protein is important for athletes to facilitate muscle growth and repair. Dairy proteins, in particular whey proteins, are marketed to athletes to build muscle mass and strength and improve athletic performance, but with varying levels of evidence to support their efficacy.

In 2010 the European Food Safety Authority (EFSA) rejected health claims related to whey protein increasing muscle mass and strength. EFSA cited a lack of studies comparing whey protein with other protein sources (most evidence compared whey with carbohydrate) and that many studies used surrogate markers of muscle mass (e.g. protein synthesis) which are not acceptable as evidence to support health claims. The few studies that had compared whey protein with other protein sources using acceptable outcome measures were small and had shown conflicting results. Additional large studies comparing whey protein against other protein sources are required to provide evidence to support health claims for whey protein increasing muscle mass and strength.

The dairy industry is seeking to identify bioactive protein fractions from milk which can provide benefits for athletic performance. Some success has been had in this area with preliminary studies demonstrating that the whey component of colostrum can improve athletic performance, whey growth factor extracts can increase muscle strength, and hydrolysates of whey protein can promote recovery of muscle strength after heavy exercise.

Whey, and derivatives of whey, hold considerable potential as nutritional supplements to improve athletic performance, but well designed and well-controlled studies are required to underpin their efficacy and support health claims.

Notes

Professor Peter Howe

Nutritional Physiology Research Centre, University of South Australia



Peter Howe is a research Professor in the School of Health Sciences at the University of South Australia. Peter is a recognised authority on cardiovascular and metabolic health benefits of bioactive nutrients, in particular omega-3 fatty acids. A former scientist at CSIRO's Division of Human Nutrition in Adelaide, he built strategic alliances with the food industry to develop functional foods and contributed to regulatory policy development. He established the Smart Foods Centre at Wollongong University in 1999 and, since returning to Adelaide in 2002, the Nutritional Physiology Research Centre and the ATN Centre for Metabolic Fitness, aimed at optimising physical and mental health through diet and lifestyle. He is a Fellow of the Nutrition Society of Australia and Editor-in-Chief of the on-line journal *Nutrients*.

Abstract

Omega-3 requirements - length matters!

Although omega-3 is rapidly becoming a household term, consumers are still confused about the different types of omega-3 fatty acids, what distinguishes them and what are the respective intake requirements for short (plant) and long chain (LC, marine) omega-3. The essentiality of omega-3 in the diet has long been recognized and addressed by recommending regular consumption of α -linolenic acid (~1-2g/d) from plant sources. More recently, however, there have been recommendations to additionally consume pre-formed LC omega-3, amounting to ~0.5g/d in Australia/New Zealand and 0.25g/d in Europe, with no requirement in the USA or Canada. Such differences tend to reflect the arbitrary nature of recommendations. However, the Omega-3 Index, a measure of the LC omega-3 content of red blood cells, offers an evidence base for intake recommendations to improve cardiovascular health. It provides a simple measure of omega-3 status and serves as a guide for intake requirements in individuals. Assessments of the Omega-3 Index in vegans highlight the value of consuming pre-formed LC omega-3. Further attention should be given to the important distinction between short and long chain omega-3 and the need to increase public awareness of food sources, particularly in advertising.

Notes

Dr Peter Nichols

Food Futures Flagship, CSIRO Division of Marine and Atmospheric Research



Peter D. Nichols is a senior principal research scientist and leads Omega-3 and Signature Lipids research projects at CSIRO Division of Marine and Atmospheric Research; Food Futures Flagship. He has 30 years experience in lipid (fats and oils) and other analyses of biological and environmental samples, and has worked towards the development of an Australian marine oils industry, and more recently in a cross-CSIRO project that is developing novel land plant sources of health-benefitting long-chain omega 3 oils. He has participated in 3 expeditions to Antarctica and 9 research cruises, with 5 as cruise leader. He actively trains young scientists, with over 40 PhD and other students co-supervised. He has published 260 papers and prepared 400 reports for industry, government agencies and other clients. He received the AMSA Silver Jubilee Award in 2009, and was a co-recipient of the 2010 CSIRO Research Achievement Award (to the Omega 3 team).

Abstract

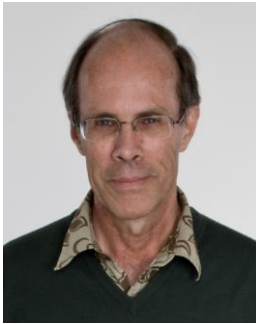
Long-chain Omega-3 Sources in a Resources Constrained World

Long-chain ($\geq C_{20}$, LC) omega-3 oils are needed for health and vitality and provide benefits across a range of disorders - heart disease, stroke, rheumatoid arthritis, some forms of cancer and other areas. It is recognized that increased LC omega-3 consumption is required, which means two to three serves of oily fish per week or by other means. Future supplies of LC omega-3 oils will not meet the predicted increasing demands for their inclusion in feeds and food and nutraceutical products. Wild harvest fisheries from which the LC omega-3 are largely obtained are considered threatened by various groups. This view is not unanimous, with recent progress establishing common ground between the opposing views and key linkages occurring towards rebuilding global fisheries and sustainability. Notwithstanding these improvements, the recognized declines in fisheries stocks, the growth of world aquaculture (main user of LC omega-3 oils), increasing world population (6 billion in 2010 to 9 billion in 2050), together with recommendations to increase seafood consumption in western diets, mean that new sources of LC omega-3 oil are needed. Alternate sources of LC omega-3 for use in aquafeed and other areas include microalgal oils and/or biomass, and under-utilized marine sources including krill. Expanding the fishing of these building blocks of the marine ecosystem should be carefully considered before a marked increase in exploitation of krill resources occurs. Finally, the exciting prospect is now clearly evolving for the further development and application of novel transgenic oilseeds containing LC omega-3 oils with several groups active in this area and excellent progress occurring.

Notes

Professor Robert Scragg

School of Population Health, University of Auckland



Robert Scragg is Head of the Section of Epidemiology & Biostatistics, at the School of Population Health, University of Auckland. He is a graduate of Adelaide Medical School and trained in epidemiology in the late 1970s at the CSIRO Division of Human Nutrition, in Adelaide, where he became interested in vitamin D and cardiovascular disease. Since then he has carried out studies in New Zealand showing that low vitamin D status is associated with an increased risk of both coronary heart disease and diabetes. He has recently been awarded funds by the Health Research Council of New Zealand for a large randomised trial to determine if vitamin D supplementation prevents against cardiovascular disease.

Abstract

Sustainable nutrition - do supplements do it better?

Dietary supplements are a multi-billion dollar industry taken by a substantial proportion of the population living in developed countries including Australia. Yet recent reviews summarising the results of clinical trials show that supplementation with vitamin A, B, C or E does not reduce the risk of chronic diseases such as cancer and cardiovascular disease. In fact, for vitamin A and vitamin E, they show harm with increased mortality among people taking either of these two vitamins as supplements. For minerals, recent reviews have shown that calcium supplements increase the risk of cardiovascular disease. Given these disappointing findings, attention is increasingly turning to vitamin D as a possible beneficial supplement for good health. Observational studies have shown that people with high vitamin D levels have a reduced risk of a range of diseases, including cardiovascular disease, colorectal cancer and all-cause mortality, as well as infectious disease. However, these observational findings need to be confirmed by experimental studies of vitamin D supplementation. Clinical trials of high-dose vitamin D supplementation (≥ 2000 IU per day) are now underway and are expected to determine within the next 10 years whether vitamin D is truly protective against these diseases. If vitamin D is shown to have health benefits, it is likely to be a sustainable nutrient as it is available from cheap renewable sources. These include vitamin D extracted from the lanolin in sheep wool which can be taken either as supplements or used to fortify foods, or from regular (but safe) sun exposure.

Notes

Professor Tony Worsley

School of Exercise and Nutrition Sciences, Deakin University



Tony Worsley is Professor of Behavioural Nutrition at Deakin University. Until recently he was Professor of Public Health at the University of Wollongong, NSW. His earlier positions include: Senior Research Advisor at the Victorian Health Promotion Foundation, Professor of Public Health Nutrition and Head of the School of Exercise and Nutrition Sciences, Deakin University, Professor of Public Health, University of Adelaide, and Senior Principal Research and Scientist, Division of Human Nutrition, CSIRO, among others. He has been a member of the Australian Academy of Sciences' Nutrition Committee; Co-Executive Editor of *Appetite*, and the *International Journal of Behavioral Nutrition and Physical Activity*.

He has wide experience in the evaluation of public health nutrition programs, and in the promotion and maintenance of food behaviour change. He has published widely in scientific and professional journals. He has authored several books including *Nutrition Promotion, Public Health Nutrition* (with M Lawrence), *Food People and Health*, *The Food System*, *The Use and Abuse of Vitamins and the Body Owner's Manual*. Recent research projects include: The development of dietary approaches to stop hypertension; examination of the adoption of plant based foods by consumers and industry; consumers' attitudes towards children's foods at school, examination of public support for fruit and vegetable policies, and, baby boomers' future food and health needs.

Abstract

Consumers and Food: sustainable what?

This presentation is in two parts. In the first part current consumer food trends, purchasing drivers and lifestyle segmentation will be briefly reviewed in relation to recent views of the brain systems which partly control food behaviours. These include reflective and automatic approaches to information. In the second part of the presentation the focus will be on our group's recent research. This has examined the influence of personal values and social ideologies on people's shopping styles and food consumption, as well as their food and health concerns, views of food policy options and environmental interests. It will be shown that approaches to these food issues are related to their world views as well as demographic factors. For example, the population segment which holds strong Universalism values (pro nature, harmony, community) tends to be more aware of food system issues and expect more government intervention on food related matters than other people; those that value security are more aware of food safety issues.

It is clear that environmental interest is only one of many factors which can influence people's food activities. It will be argued that a better food knowledge base is required in the population if the food sustainability challenges of the early 21st century are to be constructively addressed. This will require regular monitoring of the population's awareness of food issues as well as more co-ordinated, trustworthy communication activities by stakeholders.

Notes

Co-Hosted by



Nutritional Physiology
Research Centre

The Nutritional Physiology Research Centre has an international reputation for human research on the roles of nutrition and physical activity in attaining and maintaining optimal physical and mental health and in counteracting obesity and the diseases of affluence. The Centre recognises the economic and social importance of addressing both diet and lifestyle in order to optimise health development and counteract risk factors for chronic disease across the lifespan.

Our research addresses cardiovascular, metabolic, anti-inflammatory and mental health benefits of diet and physical activity and the underlying mechanisms in populations ranging from patients with chronic disease to elite athletes. Physiological effects of whole foods (e.g. dairy, pork), bioactive nutrients (e.g. omega-3, phytoestrogens, antioxidants) and other dietary factors are evaluated, alone or in combination with regular exercise, in human trials.

The Centre's research programmes are supported by Category One Funding (ARC, NHMRC and NHF), other Government funding and partnerships with food the industry. Research outcomes are expected to benefit food industry partners and consumers by supporting the development of healthier food products and substantiating associated health claims, and informing public health recommendations for nutrient intakes and physical activity requirements.

www.unisa.edu.au/nutritional.physiology



Healthy Development Adelaide (HDA) promotes, facilitates and undertakes research that advances multidisciplinary understanding of healthy development by combining research strengths addressing high priority research issues to ensure the physical, psychological and social health of Australian infants, children and adolescents.

HDA was initially established in 2004 as an initiative of the University of Adelaide and is led by Professors' Robert Norman (University of Adelaide), Caroline McMillen (UniSA) and Michael Sawyer (University of Adelaide / CYWHS).

HDA has over 150 members currently and fosters research in over 20 disciplines across the state with focus to developing a portfolio for South Australia in developmental health research. HDA crosses many sectors that include government, health service, university, allied health, associations, organisations/institutions and the general community.

Partners include UniSA, Women's and Children's Health Research Institute, Channel 7 Children's Research Foundation, Department of Education and Children's Services. As of 2010 new Partners include Fertility SA, Children Youth & Women's Health Service, Flinders University and Flinders Reproductive Medicine.

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