

Food and Nutrition

*School of Exercise and Nutrition
Sciences*

Deakin University

Number 2, November 2009

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FOOD AND NUTRITION NEWS

Welcome

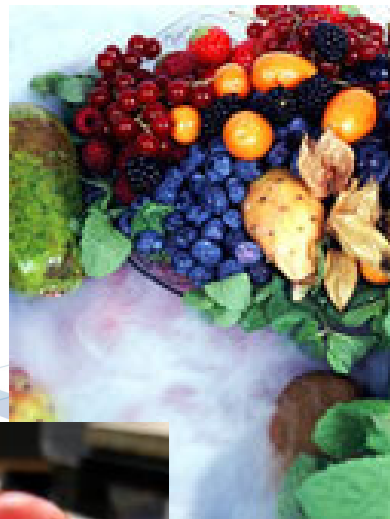
2009 has been a very good year for the Food Science and Nutrition team with continued high achievement in teaching and research. For example, the ENTER score is used as a key marker of our success in attracting high calibre students and in 2009 our ENTER score was 78, five points higher than 2008 and the highest among similar Victorian courses. Such results are a reflection of the commitment and professionalism of our staff and reinforce our position as the top Food Science and Nutrition course in Victoria.

In this issue of the Food Science and Nutrition newsletter, topics range from salt in the food supply, to sensory and consumer science, to student and staff awards.

We are all looking forward to a prosperous and successful year in 2010.

Russell Keast (PhD)

On behalf of the Food Science and Nutrition Course Team.



Food and Nutrition students enhance their industry experience

Students in the HSN306 unit, Product Development and Processing, recently participated in training sessions at Food Science Australia, Werribee, which aimed at enhancing their practical experience in food processing technologies. Dr. Shirani Gamlath, the unit chair, organised sessions for final year undergraduate students at this world class pilot plant facility. Students were able to gain significant experience in food processing operations such as pasteurisation, canning, the UHT process and innovative technologies such as high pressure processing. Such activities could not take place without the support of Food Science Australia and funding from Regional Development Victoria. The Food Skills program was launched in May 2009.

For more information please contact Dr. Shirani Gamlath
shirani.gamlath@deakin.edu.au.

THE SCIENCE OF SALT: INDUSTRY INNOVATION AND BEST PRACTICE IN REDUCING SALT IN FOODS

Over 100 delegates attended this ILSI symposium held in at the George Institute for International Health in Sydney on 2 July 2009. The symposium set out to explore the challenges and opportunities faced by the food industry in reducing salt in processed foods. Professor Andrew Sinclair, Professor of Nutrition in the School of Exercise and Nutrition Science and Chairman of International Life Sciences Institute chaired the meeting.

Professor Bruce Neal, Senior Director at the George Institute for International Health and Chairman of the Australian Division of World Action on Salt and Health (AWASH) set the scene in relation to salt and health. He acknowledged that the food industry was in a unique position to make a difference in reducing population salt intakes and hence saving lives, by reducing salt in processed foods. He highlighted the fact that people only need a very small amount of salt (1-2grams) for good health, but that most people in most countries are eating 5-10 times this amount with a range of adverse consequences for health. Reducing salt intake by 3g/day would immediately lower population systolic blood pressure by about 5mmHg resulting in a reduction of stroke risk by 15% and a reduction of CHD risk by 9%. A national salt reduction program would be very low cost (about A\$10M per annum for Australia) compared to clinical hypertension program (about A\$1000M per annum).

Dr Geoffrey Annison from the Australian Food and Grocery Council provided an overview of the progress by the food industry in reducing salt in foods and then highlighted some of the pros and cons of population versus individual approaches to

Continued on next page...

Students at the Innovative Food Processing Centre, Werribee



MELBOURNE | GEELONG | WARRNAMBOOL

Undergraduate Student Awards

Second Year Studies

Head of School Prize
Samantha Gagovska

Nu Mega Ingredients Prize for the most outstanding student in HSN206 (Food Analysis and Quality Assurance)

Chris Weng

Agilent Technologies Prize for most outstanding student in HSN203 (Food Composition)

Kang Wang

McFarlane Marketing Prizes for the most outstanding student in HSN201 Principles of Nutrition

Samantha Gagovska

Third Year Studies

Anadis Limited Prize for the most outstanding student in HSN304 (Food Biotechnology) – Joint winners

Thorsten Kasel and Joel Cullen

Cadbury-Schweppes Prize for the most outstanding student in HSN303 (Functional Foods)

Thorsten Kasel

Freedom Foods Prize - for the most outstanding student in HSN303 (Functional Foods)

Thorsten Kasel

The Food Science and Nutrition course staff wish to congratulate all prize winners.

We look forward to presenting more prizes to successful recipients from the Bachelor of Food Science and Nutrition program in 2010.

"The Science of Salt:" continued from previous page...

population health. He highlighted recent evidence for the relationship between salt and blood pressure from Clinical Science 2009 (Sailesh Mohan and Norm R. C. Campbell) and said that 'the food industry recognizes the issue and in general is completely on board with the concept that it is not a bad idea to reduce salt in foods'.

Dr Ingrid Appelqvist (Commonwealth Scientific and Industrial Research Organisation) discussed the opportunities and challenges in relation to technical approaches to salt reduction. She highlighted the fact that different foods with similar salt contents don't necessarily have the same salty taste. The challenge for food technologists was how to get the same salty taste in a food with less salt. She said that whilst salt could be reduced in some foods by as much as 30% straight away, for other foods it would take much longer, perhaps as much as 10 years, to get the technology right.

Dr Jennifer Moss, Director of Research and Development at Unilever, then described Unilever's salt reduction strategy. Unilever announced a global commitment to a reduction in salt across its products to target a dietary intake of 6g of salt per day by the end of 2010, with a further reduction targeting an intake of 5g per day for the end of 2015. This is supported locally in Australia. Dr Moss concluded that with 75-80% of salt in the Australian diet coming from processed food products, the food industry has a social responsibility to reduce the salt content of the food supply and that the challenge was now how to create a consumer demand for low salt foods in Australia, so that salt could become a marketing opportunity for companies providing incentives for further reductions.

Dr Russell Keast (Deakin University) discussed salt taste and appetite, the flavour effects of salt, salt taste over a lifespan and the implications of salt sensitivity. He said that biologically, sodium is very important and that people may have developed an appetitive response to salt billions of years ago when they adapted from living in the sea to living on land. Dr Keast explained that there was a wide "bliss" range for salt with large salt intakes required before individuals with a low salt tolerance found the food unpalatable. At the other end of the spectrum, people who were more sensitive to salt tastes were more likely to like low salt foods. He concluded that our tastes will adapt to the food environment whether it is high or low in salt but that we need to reduce salt slowly. Dr Keast supported the idea of mandated targets or salt levels for different food categories to drive reduced intakes.

Melinda Currie (Firmenich) outlined two technical solutions for reducing salt in foods: salt replacers and salt enhancers. Salt replacers, she described as substances other than sodium chloride which themselves have a salty taste. Potassium chloride (KCl), the most popular salt replacer, has metallic, bitter tastes with markedly less saltiness. Salt enhancers are usually based on the use of yeast extracts, nucleotides, amino acids, lactates and monosodium glutamate.

Student Placements

Industry training for Food Science and Nutrition students.

In support of the HSN 311 Food Science and Nutrition practicum which runs during Trimester 1 and 2, Heinz Pty Ltd recently hosted 2 third year students from Deakin University's H315 Food Science and Nutrition degree. The placements were for approximately 3 weeks (100 hours) and each student was required to complete a project during their time at Heinz, in fulfilment of the criteria for HSN311.

Ms Alexandra Wall undertook her placement with the Product Innovation Nutrition Group (PING) team updating and creating nutrition and allergen data charts whilst Ms Elena Papamiliadous undertook her placement with the Quality Assurance (QA) team on an Ingredient Specification project.



Ms Alexandra Wall

Postgraduate Student Awards

Deakin PhD student Sara Cicerale has been awarded the 2009 Malcolm Bird Commemorative Award at the Australian Institute of Food Science and Technology (AIFST) Convention held in Brisbane last month.

The award is for young members who demonstrate academic achievement, leadership and integrity.

According to the judges, Sara has been doing this in her research on oleocanthal (a natural anti-inflammatory compound in olive oil).

"It was a real surprise," she said. "It is fantastic to have this sort of recognition ... it does make all the hard slog towards your PhD even more worth while."

Dr Russell Keast is Sara's supervisor at Deakin and he was full of praise for his talented PhD student.

"There is no doubt that Sara deserves this award," he said.

"She is an excellent student involved in some high quality research."

The selection of the winner of the Malcolm Bird Award is based on the merit of a written submission regarding a critical review or original research.

By becoming a finalist in the award, Sara Cicerale received free flights, accommodation and registration for the AIFST National Convention.

On winning the award, she was presented with a cheque for \$1000.

The award is named in honour of Malcolm Bird, the fifth President of AIFST who died in 1977, soon after completing his term of office.



Above: From left AIFST Vic Branch Chair, Michael Black, Sara Cicerale and AIFST Vic Branch Committee Member Cheryl Taylor.

News from Sensory and Consumer Science

Sensory and consumer research has shown large growth over the past 20 years. We live in a consumer society and companies that flourish meet the needs and wants of the consumer. Within the School of Exercise and Nutrition Sciences we are growing the area of sensory and consumer science. Two staff members are involved, Dr Russell Keast and Dr Gie Liem, as well as PhD, honours and international visiting students.



Ms Elena Papamiltiadous

These positions provided both students with an understanding of the whole business and enabled them to apply the theory they learned during the course and put this into practice in private industry. Both students found the experience invaluable, with regard to the relationship between departments at Heinz and how QA and Nutrition fit into the company.

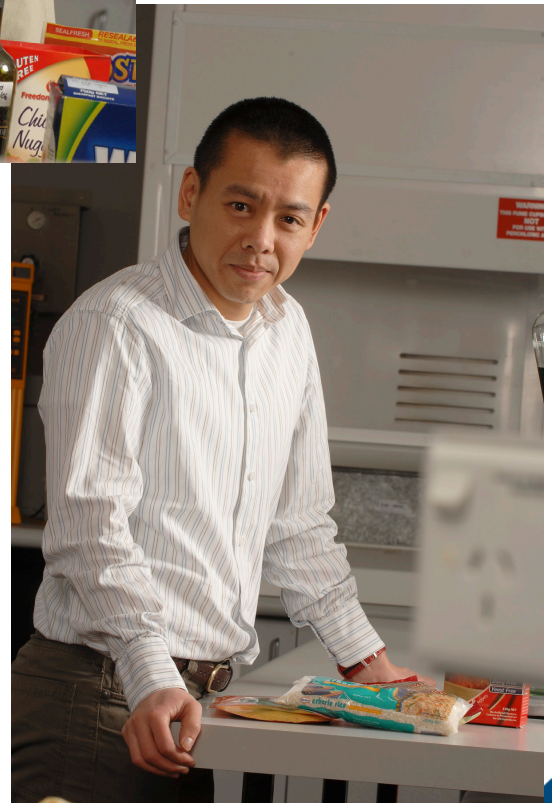
The School of Exercise and Nutrition Sciences, Deakin University wishes to thank Heinz Pty Ltd. for their ongoing support during the placement program.

If your company is interested in participating in the Food Science and Nutrition Practicum please contact:

Dr Stuart Smith
stuart.smith@deakin.edu.au



Dr Russell Keast



Dr Gie Liem

The sensory world of children

Most of our food preferences and eating habits develop during our childhood. Children are therefore an important group to focus on in terms of healthy eating. Unhealthy food choices of children are underpinning the alarming rate of child obesity in Western societies and put children at risk for diseases nobody wants their children to develop. Children are also an important group of consumers. Developing healthy products which children like and repeatedly are happy to consume is, however, trickier than you may think.

The sensory world of children is quite different from that of adults. Children prefer higher concentrations of sweetness and may possibly perceive tastants as more intense than adults due to a higher density of taste buds. You may recognize in your own experience, that the foods children select to consume is often not the food we would choose as an adult. Children's liking for foods is dynamic and will change over time. The change in liking is influenced by a wide variety of factors such as flavour intensity and shape of the food.

The sensory consumer group at Deakin University is an active research group in the field of food choice of children. How can we measure children's sensory perception?

Development of descriptive analysis panel

It has been said that descriptive analysis is the most sophisticated tool available to the sensory scientist. Descriptive analysis relies on 6-12 highly trained people to evaluate the flavour of a food product. The descriptive analysis panel goes through a screening procedure to ensure an individual can accurately perform subtle tasks – at this stage perhaps only 1 in 3 people are selected for further training. The next phase is an extensive training protocol to ensure they have the ability to accurately and reproducibly describe and quantify the flavours that make up a particular food. During this stage the panel learns about taste, smell, chemical irritation, texture via lectures and practical training in our sensory lab. By the time a panel is ready for testing real foods, they have collectively clocked up between 300-1,000 hours of training. That is a lot of hours, but at the end of the process, the panel is a very valuable commodity.

Descriptive panels are often used in product development processes, checking consistency if there is a process or ingredient change to an existing product, or keeping an eye on competitors products and how they may be altering their formulations. Having high quality data on which to make critical business decisions is essential, that is why the hours of training are needed.

We have established descriptive panels at Deakin University. If you are interested in using the panel for testing products, please contact Russell Keast (russell.keast@deakin.edu.au) for further information.



*The sensory world of children”
continued from previous page*

How important is sensory perception for children’s food choice? What is the role of motivation and desire in children’s food choice? Can we change children’s long term food choices by altering sensory perception and motivation? Answers to these and related important questions are the soul of what we do.

In one of our recent studies we investigated the role of liking and motivation in children’s vegetable consumption. The main outcome of this study is that motivation plays a key role in children’s vegetable consumption. Next year we aim to increase children’s motivation, in order to guide children to healthier food choices. In a recent publication we proposed that cutting foods in small pieces will help children develop a stable liking for foods. Whether this strategy will help children consume more vegetables is the aim of our future studies.

Currently we advise and collaborate with food industry, on how to develop sensory methods and products that meet children’s sensory and nutritional needs. We work together with key researchers in the field of food choice of children and continuously aim to better understand the sensory world and food choices of children.

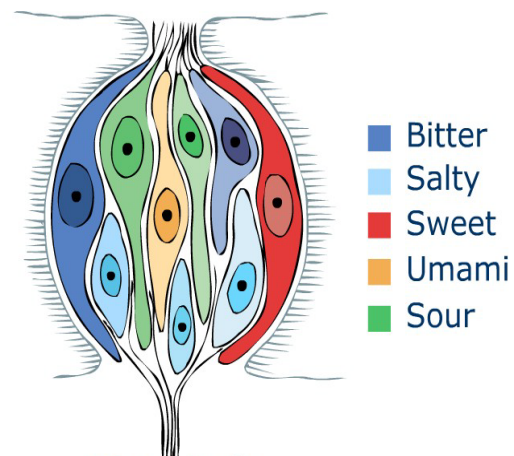
For more information please contact gie.liem@deakin.edu.au

Latest research news – Fat taste

It should be common knowledge that there are five basic tastes: sweet, sour, salt, bitter, and umami. For those of you who thought there were only four, umami is a descriptor for savoury or chicken stock taste and it is now widely regarded as the fifth basic taste. For a taste to be widely accepted in the scientific community it must pass some strict criteria: there must be receptor mechanisms for the tastant located on taste receptor cells, there must be signals sent from those taste receptor cells to the taste processing regions of the brain, the brain must be activated by the tastant, and the perception must be distinct from other basic tastes. All of these things must happen and be unequivocal for basic taste status. Even though the vast majority of researchers in the taste field believe umami is the fifth basic taste, there are still some who are not convinced.

This leads me to research from our group investigating the potential sixth taste – fat taste. At this stage there is insufficient evidence and far too much controversy to be definitive about the existence of fat taste it will probably take another 10-20 years before there is general consensus. However, research from our lab appears conclusive we have been able to develop a fat taste threshold method using oleic acid (C18:1). As with all taste we expected to observe, and did observe, large individual variation in sensitivity to oleic acid. Given that we can determine oral taste thresholds for oleic acid, and there are fat taste receptor mechanisms located on taste receptor cells in humans, it appears likely that humans may possess a sixth basic taste – for fat!

Jessica Stewart is completing her PhD on this topic, so watch this space for more news on fat taste, and the functional role fat taste may play.



Food Science and Nutrition Staff Award

Dr Lynn Riddell, senior lecturer in Food Science and Nutrition, was awarded the Vice-Chancellors award for excellence in teaching in recognition of her consistent high quality teaching and leadership.



Dr Lynn Riddell

New Staff in Food Science and Nutrition

Phillip Parker

Phillip Parker started as a lecturer in Food Science in July 2009. Phillip's research employs molecular biology techniques to examine potentially important bioactive compounds in bovine milk and he is involved in teaching a number of undergraduate units.

*"New Staff"
Continued on next page*

Nutrition research team unravelling the complexity of dairy foods responses in the human body

A research team led by Associate Professor David Cameron-Smith and Professor Andrew Sinclair are tackling the question of exactly what happens to fats and proteins from dairy foods inside the human body.

A clinical team led by postdoctoral research fellow, Dr Maxine Bonham and Dr Amy Larsen have been working throughout 2009 feeding men (aged 40-60 years) high and low fat breakfasts, composed of dairy products. Dairy is a rich mixture of both saturated fats and essential amino acids. Professor Andrew Sinclair is particularly interested in the dairy fats. "We have thought of dairy fats as being dangerous for heart health, because of the high saturated fat content. However, we haven't considered how the complex fats in dairy foods are digested or where they go in the body" he says. One place fats end up is in adipose tissue. This research is unique in that it takes small samples of abdominal fat using a needle biopsy. Professor Sinclair contends "The small discomfort of having a tiny sample of body fat is dwarfed by the unique insights that will be gained in understanding the complexity of where fat goes and what it does in the body". A PhD student funded through this project, Aimee Dordovic is analysing the many thousands of genes and signalling pathways that respond to fats.

"Dairy food is not just fat, it is also a great source of amino acids" says David Cameron-Smith. Along with another PhD student, Petra Gran, David wants to know whether the proteins in dairy food support anabolic metabolism and muscle growth. "Building from our studies of muscle growth and repair, we want to get to know how amino acids are taken up by cells of the body and whether they can activate signals that initiate growth".

This large scale clinical trial is running until the end of 2010 and is funded by the Dairy Health and Nutrition Consortia (DHNC). Male volunteers between the ages of 40-60 years are required to participate in the study over 2 mornings. A full blood profile is provided.

For further information contact Dr Maxine Bonham either via email (Maxine.bonham@deakin.edu.au) or phone (03) 9251 7256.



New Staff in Food Science and Nutrition

Marian Cornett

Marian graduated from Deakin University with a Bachelor of Science with Honours in 1993 before going on to Monash University to complete a Master of Science degree by research in molecular genetics. After working for a number of years in research Marian returned to Deakin University in 1990 to complete her Graduate Diploma of Dietetics.

Since graduating as a dietician Marian has worked in varied clinical areas and in research, both in Australia and in Canada. Her areas of expertise and interest are in eating disorders and adolescent eating as well as in sports nutrition. On returning to Australia from Canada in 2001 Marian worked as a consultant dietician - setting up an eating disorders service program in Geelong, working in private practice and working with the Geelong Football Club as their sports dietician.

Marian has been living in Port Fairy and lecturing at Deakin's Warrnambool Campus in Nutrition and in Physical Activity and Health since 2007. She is also currently researching peer influences on adolescent eating for her PhD.

School of Exercise and Nutrition Sciences launches a joint research centre with the Fijian School of Medicine

The School of Exercise and Nutrition Sciences launches a joint research centre with the Fijian School of Medicine on the prevention of obesity and non-communicable diseases

The Pacific region has the highest prevalence of obesity globally, with some countries registering over 90% of adults as either overweight or obese.

The School of Exercise and Nutrition Sciences and the Fiji School of Medicine have collaborated over the last five years, on obesity prevention in adolescents with associated economic, socio-cultural and policy studies. This has provided the platform for a joint research centre – the Pacific Centre for the Prevention of Obesity and Non-communicable Diseases or C-POND – which was launched on 25/8/09 in Nadi, Fiji.

The launch occurred at a major Pacific forum on non-communicable diseases, jointly sponsored by the World Health Organisation (WHO) and the Secretariat of Pacific Communities (SPC). Dr Chen Ken, the WHO Representative for the South Pacific, officially launched the centre, noting that the School of Exercise and Nutrition Sciences WHO Collaborating Centre for Obesity Prevention was a major asset for the region. Indeed, it is the only WHO Collaborating Centre out of over 800 internationally, dealing primarily with obesity. He noted the critical importance of research and program evaluation expertise in directing the efforts to reduce non-communicable diseases such as type 2 diabetes which are affecting nearly one in two adults in some Pacific countries.

Deakin University was represented by Professors Boyd Swinburn, Professor Marita McCabe, Dr Marj Moodie, Dr Helen Mavoia and Wendy Snowdon who are chief investigators on over \$750,000 of competitive grants in obesity prevention that Deakin holds with Fiji School of Medicine. The Dean of the Fiji School of Medicine, Professor Ian Rouse, also welcomed the new Centre as evidence of the growing importance being placed on research to guide action in the Pacific.

Professor Swinburn noted that, unlike other epidemics such as tobacco and road injuries, the rich countries such as Australia have no track record to emulate in terms of obesity prevention, so Pacific countries had to find Pacific solutions to the problem. Therefore, Australia had as much to learn about the effective interventions in Fiji as Fiji has to learn about what works or does not work in Australia. C-POND will provide much of the research and evaluation to underpin the solutions to the massive epidemic of obesity and non-communicable diseases.

Fun Bits

Nothing will benefit human health and increase the chances for survival of life on earth as much as the evolution to a vegetarian diet.
– Albert Einstein

Pleasure is divided into six classes: food, drink, clothes, sex, scent and sound.
Of these, the noblest and most consequential is food...
...the pleasure of eating is above all pleasures”
- Al-Baghdadi

"The history of every major Galactic Civilization tends to pass through three distinct and recognizable phases, those of Survival, Inquiry and Sophistication, otherwise known as the How, Why, and Where phases.
For instance, the first phase is characterized by the question "How can we eat?
The second by the question "Why do we eat? And the third by the question, "Where shall we have lunch?"
- Douglas Adams



Publications in 2009 by Food and Nutrition Staff

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*Fun Bits continued
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'Ice cream flavour galore', a January 1994 Reuters News service story on Manuel Oliveira's ice cream shop in Merida, Venezuela, reported on his 567 flavours, including onion, chilli, beer, eggplant, smoked trout, spaghetti parmesan, chicken with rice, and spinach. He said some flavours fail; he once abandoned avocado ice cream, and tossed out 99 pounds of it, because it wasn't smooth enough

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*Fun Bits continued
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Improving fry cooking time. In January 1994, 'The Economist' magazine reported one of Secretary of Energy, Hazel O'Leary's success stories about government research scientists hired out for civilian business uses, was the Argonne National Laboratory's helping McDonald's to find a way to speed up french frying. A team headed by physicist Tuncer Kuzay, who interrupted his work on advanced photons, placed sensors inside the frozen fries and was able to design special frying baskets to deal with the effect of steam created by melting ice crystals and to cut 30 to 40 seconds off each batch's frying time.

"Gluttony kills more than the sword."
- George Herbert (1593 -1633)

"To lengthen thy life, lessen thy meals."
- Benjamin Franklin (1706-1790)

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