

News

The following news items illustrate some of our activities during the first 4 months of 2012. To keep up to date with our activities, please take a look at our news pages at:

<http://www.reading.ac.uk/foodbiosciences/about/foodbio-news.asp>



January 2012 - New lecturers in the Department of Food and Nutritional Sciences.

Dr Colette Fagan was appointed as a lecturer in Food Processing Science in September 2011. She joined the Department from the School of Agricultural, Food Science and Veterinary Medicine at University College Dublin, Ireland. Her main research interests are in the area of process analytical technology and in particular the application of optical spectroscopy for the development of robust processes. This includes the development of sensors for monitoring and controlling operations across the food chain from 'farm-to-fork', to ensure safety, quality and consistency of food products.

Dr Jose Oruna-Concha obtained her PhD from the University of Santiago de

Compostela (Spain) for work entitled "Effects of conservation on the chemical composition of *Capsicum annuum*, L." After obtaining her PhD she worked as a Research Fellow in the Department of Food and Nutritional Sciences on several projects sponsored by major food companies. Her research interest has been focused on identifying taste compounds present in foods and their role in flavour formation via the Maillard reaction. Current work includes the study of the influence of processing techniques on bioactive compounds, such as flavanols, looking at Maillard chemistry and their impact on bioavailability and health benefits. She has extensive expertise in analytical techniques including CE, GC-MS, LC and LC-MS.

Dr Niamh Harbourne joined the Department of Food and Nutritional Sciences as a lecturer in Food Processing in November

2011. Before her appointment she worked as a postdoctoral researcher in the Institute of Food and Health, University College Dublin. Her current research interests are in the area of plant bioactives, including the extraction of bioactives from plants and the effect of processing on these compounds. She is also interested in the incorporation of functional ingredients into food matrices.

The Department is delighted to welcome Colette, Jose and Niamh to work with us both as researchers and as part of the lecturing staff.

24 January 2012 - Universities & Science Minister visits the Food ATP



David Willetts, Universities & Science Minister, was impressed by the Food Advanced Training Partnership during his visit to the University of Reading on 24th January 2012.

The University of Reading hosted the Ministerial launch of a £67m

scheme for PhD studentships funded by the Biotechnology & Biological Sciences Research Council (BBSRC). During the visit, the Minister met with the Food ATP Director, **Richard Frazier**, and two of the industrial partners from Kraft and Waitrose.

Reading is the lead partner in the Food ATP, one of four Advanced Training Partnerships in the UK funded by BBSRC. The project brings together more than 20 industrial partners to develop the skills needed to support the sustainable production of healthy food and lead innovation in the food industry.

The University is also leading one of the BBSRC-funded Doctoral Training Partnerships announced by the Minister. The £1.8m Doctoral Training Partnership will provide training for 18 PhD students to address the challenges of feeding the global population healthily and in a sustainable way. Together, the Food ATP and the Food Security DTP will address the urgent need for high level skills in the food and agricultural industries.

During his visit Mr Willetts also toured the Hugh Sinclair Human Nutrition Group and the pilot plant in the University's Department of Food and Nutritional Sciences, and the cocoa glasshouse used for vital research into sustaining future crops.

The food processing pilot plant in the Department of Food and Nutritional Sciences is the in the UK. The facility is equipped with a wide range of equipment and machinery, with a value of over £4million. Projects range from simple one-off process trials to long-term studies in which concepts are developed through to pilot scale production.

The Hugh Sinclair Human Nutrition Group has an international reputation for its research into the relationship

between diet and the risk of chronic disease such as cardiovascular disease, diabetes, neurodegenerative disease and cancer. A particular strength is the diverse range of facilities and investigative techniques employed, including cell and molecular methods, model system studies and human intervention trials.

For more information about the Minister's visit and the Doctoral Training Partnership scheme that was launch, please see the full press release:

<http://www.reading.ac.uk/about/newsandevents/releases/PR429322.aspx>

22 March 2012 - Flavour Away Day

All those involved in Flavour Research in the Department of Food and Nutritional Sciences gathered for an intensive day of presentations and discussions at Shinfield Grange on 22nd March.

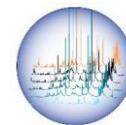


All 22 of the participants presented some aspect of flavour science and they were joined by Emeritus **Professor, Don Mottram**, and visiting researcher and independent consultant, Dr David Baines (BFC).

The morning session focussed on taste research, led by **Dr Lisa Methven**, whose projects look at changes in sensory perception with age and the optimisation of food intake in older people. This was followed by a session on

analytical methods, brainstorming recent problems and identifying novel applications for LC-MS. After lunch, the focus was on flavour generation during thermal and high pressure processing of various products including milk, carrots, broccoli, rice and french fries. The presentations at the end of the day focussed on the impact of food components on human health, with talks on the polyphenol content of coffee and cocoa as well as the analysis of proteolytic metabolites found in the human gut.

11th-13th April 2012 - First Nutrimetabonomics Workshop considers use of new technologies to assess gut bacteria and their metabolism.



The Department's first Nutrimetabonomics workshop was held at the Henley

Conference Centre. This workshop was designed to provide a basic understanding of the metabolic profiling approach and how to apply it to nutrition studies, with a particular focus on data analysis.

Experts from the Food Microbial Sciences Unit (FMSU) at the University of Reading as well as external contributors from the University of Cardiff and Imperial College London attended the workshop. The event was sponsored by Korrigan Sciences who provided statistical training support.

Metabonomic-based research has been rapidly expanding across the University over the last few years and is now contributing to many projects in agriculture, food technology, biomarker discovery, host-microbes interactions and various external contributions with hospitals and international institutions.

The event was a real success, as indicated by the great comments it received:

"Brilliant workshop. Excellent speakers and interaction between participants and organisers, both scientifically and socially. Hands-on sessions were extremely good! [...] Very nice workshop indeed."

"Good selection of speakers. Talks delivered with enthusiasm and in depth."

For more details please contact **Dr Jon Swann** and **Dr Sandrine Claus** (Reading University)

12 April 2012 - Introducing Martin Woodward - new Chair of Gut Microbiome Studies



The Department is delighted to announce that **Professor Martin Woodward** has joined the Department this month as the first in the University's new strategic investment posts.

Martin is a top class international researcher who specialises in microbiology. He has over 30 years of experience in microbiology that has focused on public and veterinary health.

As well as undertaking research within the Department, Martin will play a leading role in the microbiology strategies across campus and will have a pivotal

role in the Centre for Food Security. It is a great coup for the University to acquire someone of Martin's talent and calibre.

Martin is looking forward to working closely with colleagues in the Department with expertise in in vitro gut models to take his interests in the control of gut borne pathogens in the context of the gut microbiome further.

His particular interests have been in the host pathogen interactions primarily of gut borne pathogens such as the non-typhoidal Salmonellas, the various pathotypes of Escherichia coli especially E. coli O157, Clostridia, Brachyspira and other spirochaetes.

Martin has also worked on developing novel approaches to suppress the carriage of food borne pathogens including studies on the use and impact of antimicrobials, especially innate and acquired resistance, the potential that pre- and probiotics may have and the development of vaccines.

April 2012 - Annual Kerry Product Development Prize for Final year Students

A nutritional supplement aimed to tackle malnutrition in older people has been the winner of this year Annual Kerry Product Development Prize for Final year Students.



Sarah Bodger, Haile Guo, Virginia Lewis, Pannik Noppun,

Rachael Taylor and **Henry Forshaw** developed an oral nutritional supplement product for older people at risk of undernutrition

As well as producing the product they had to present a poster showing production issues, HACCP, Marketing etc. as well as designing the packaging.

Kerry Group has been sponsoring the Food Product Development module in Part three since 2002.

A representative from Kerry attended the presentation at the end of the Spring term and acted as one of the three judges. The group has been awarded £500 which will be presented to them on graduation day.

Congratulations to all of them.

21st January 2012 - Food Science Student Placement Award – The Food Industry Wins Again

The annual Malham Award for excellence in industry (*previously the Hutchinson Jonas Award*) has this year gone jointly to **Jake Schneider** and **Daniel Mortimer**.

The award is in recognition of their achievements during exceptional placements at **Jordans Ryvita** and **RF Brookes** respectively.



The award, now in its fifth year, was presented by Scott Hutchinson, Head of Talent at Malham Consultancy, at an informal lunch hosted by **Professor Mike Gordon** and **Lilly Mae Liddicott** of the University of Reading.

The Food Science courses at Reading are a leading example of vocational courses that are succeeding in making students eminently employable. On placement, the students gain valuable experience that often leads directly onto a job. The £300 Malham Award is an incentive to excel while on placement.

Unsurprisingly, both students are bucking the current employment trend and walking into excellent roles later this year. Jake will be returning to ABF at Jordans whilst Daniel has landed a role at J Sainsbury on their leadership 2020 programme, starting in September. Congratulations to both students.

19th April 2012 - IFST and SCI Southern region Young Scientist of the Year Competition

Congratulations to two of our students, **Ditte Hobbs** and **Sawaminee Nualkaekul** (Im) who were chosen to take part in the IFST and SCI Southern region Young Scientist of the Year competition.



They each presented their work very well in front of both the judges and an audience of approximately 60 delegates representing industry, academia and research associations.

Both topics gained much interest and they were each asked a variety of both scientific and applied questions. Ditte was awarded the overall audience prize for best speaker and as well as the second prize from the judges. Well done to both students, excellent ambassadors for the Department!

RESEARCHER HIGHLIGHTS



Professor Jeremy Spencer gave a Valentine's Chemical Lunch Box lecture at Burlington House in Piccadilly hosted by the RSC on 16th February 2012.

He presented: *The cognitive lunch box*, where he talked about the role of flavonoid-rich foods, such as blueberries, cocoa and red wine, in promoting a healthy heart and enhancing our attention span. He outlined the evidence for the value of these foods and explained how they induce such beneficial changes in our bodies.

Professor Ian Rowland gave a Chemical Lunch Box lecture at Burlington House in Piccadilly hosted by the RSC on 3rd April 2012.

He presented: *Soy Beans: The World's Healthiest Food?* where he explained the origins of soy foods in south east Asia and how the bean is processed to produce

traditional Japanese foods such as tofu. The most interesting components of soy beans are the



natural substances are called isoflavones, which have hormone-like activity that has led to claims for health benefits including reducing risk of cardiovascular disease and hormone-related cancers and improving brain function

Professor Niranjana chaired a session at the CoFE 12 – the Conference on Food Engineering – held in Leesberg, Virginia, USA, 2-4 April and gave a talk on “Formation and stability of steam injected milk foams”.

Professor Niranjana and Dr Qiaofen Cheng gave a course to undergraduates in Henan University of Technology (Zhengzhou, PR China) 21-30 March, as a part of our formal links with this University.

FUNDING OPPORTUNITIES

All **Research Council and Government funding** is now online. Please see link below to the Finding Funding webpage:

<https://www.reading.ac.uk/internal/res/ResearchandEnterpriseDevelopment/FindingFunding/reas-redFindingfunding.aspx>

EURAXESS-UK (www.euraxess.org.uk). This website provides information and advice for research staff, international researchers wishing to come to the UK or for those

looking for jobs in research abroad.

TSB Food Processing and Manufacturing Efficiency collaborative R&D competition
<http://www.innovateuk.org/content/competition/food-processing-and-manufacturing-efficiency1.ashx>.

The Technology Strategy Board, the Department for Environment Food and Rural Affairs, the Biotechnology and Biological Sciences Research Council and the Scottish Government are to invest up to £15m in collaborative research and development to encourage an increase in efficiency, sustainability and competitiveness in the food processing and manufacturing sector.

This is a two-stage competition that opens on **11 June 2012**. The deadline for registration is noon on **11 July 2012** and the deadline for expressions of interest is at noon on 18 July 2012. The deadline for invited applications is at noon on **19 September 2012**.

DEPARTMENTAL SUCCESS IN OBTAINING RESEARCH GRANTS

A proposal led by **Professor Niranjan** and **Professor Sebnem Harsa** (Head of the Food Engineering Department at Izmir Institute of Technology, Turkey) to the British Council under the UK-Turkey HE Partnership Programme for £20k has been successful. The project will investigate the low environmental impact of polysaccharide based packaging for fresh-cut production. The funding of this research continues to demonstrate the Department's international research investigation links. Professor Sebnem Harsa is a UoR graduate, and did his PhD in this Department

The Department of Food and Nutritional Sciences was awarded an RETF grant of £100K for upgrade of a FACSCantoll flow cytometer belonging to **Professor Parveen Yaqoob** and the purchase of two Accuri flow cytometers for FISH analysis of gut microbiota, as well as simple fluorescence-based cell function assays. This will enable to generate more sophisticated data at lower costs as well as providing higher throughput, objectivity and sensitivity than the currently used FISH method.

Eating for your genes – Food4Me project. Food4Me is a 4-year, € 8.9 million, European Union funded project involving 25 partners across 12 EU countries.

The project aims to explore the concept of personalised nutrition in terms of its feasibility, consumer acceptance, and current public knowledge. The project also aims to create a business creation model offering insight into the future of personalised nutrition and to develop scientific tools enabling the successful implementation of an internet based dietary advice programme.

The Food4Me consortium, including the team from Hugh Sinclair Unit of Human Nutrition (**Professor Julie Lovegrove, Dr Anna Macready and Rosalind Fallaize**) and colleagues from the School of Psychology (Professor Judi Ellis and Dr Laurie Butler), will be conducting a proof of principle human intervention study which will be the first of its kind globally. This study will be designed to mimic an internet-delivered personalised nutrition service, incorporating the use of self-administered, pin-prick blood analysis and buccal swab genetic testing kits.

Results from the Food4Me studies will help to guide future research into the reduction of cardiometabolic risk and the

prevention and treatment of other nutritionally-mediated diseases. For more information please see the full press release: http://www.reading.ac.uk/web/FILES/icmr/ICMR_Highlights.pdf

PRESS RELEASE

Beetroot can lower your blood pressure



A new study led by **Professor Julie Lovegrove** and performed by

Ditte Hobbs found that even small doses of beetroot juice lower blood pressure (BP). In addition, bread enriched with either white or red beetroot had a similar effect. High BP, or hypertension, increases the risk of suffering a heart attack or stroke, the leading causes of death in the UK. It was found that a 100ml dose of beetroot juice resulted in a significant lowering of BP in the short-term (0 to 4 hours) and longer term (0 to 13 hours) and bread enriched with a similar dose of both white and red beetroot reduced BP by a similar margin.

This effect is attributed to the high nitrate content of the beetroot, which when ingested is converted to nitric oxide endogenously and increases blood flow and reduces BP. This data strengthens the evidence for a beneficial effect of nitrate-rich foods in lowering BP, even at relatively low doses. Furthermore, enriching bread with beetroot may provide a useful vehicle to increase beetroot consumption, particularly for those people at risk of cardiovascular disease.

This study was published in *Br J Nutr*, 2012, 114:1-9 by Hobbs DA,

Kaffa N, George TW, Methven L, Lovegrove JA.

PhD NEWS

The following students successfully defended their PhD theses since the beginning of the year. We pass our congratulations to all of them.

Paulina Garcia Macias, *Effect of Triacylglycerol Composition on the Properties of Shortenings for Puff Pastry*, supervised by Professor Mike Gordon and Dr Richard Frazier.

Claire Payne, *Rheological characterisation of commercially available thickeners for patients for dysphagia*, supervised by Dr Alan Bell and Dr Lisa Methven.

Intiaz Hussain, *Rheology and Microstructure of Mozzarella-type Curd Made from Buffalo or Cow's Milk*, supervised by Dr Alan Bell and Dr Alistar Grandison.

Azmil Ahmad Tarmizi, *Deep fat frying – Novel Strategies for Lowering Oil Uptake and Minimising Oil Quality Deterioration*, supervised by professor Niranjana and Professor Mike Gordon.

Hajo Roozendaal, *Determination of water and wheat bran interaction and their effect on a dry cereal product*, supervised by Dr Richard Frazier and Dr Madian Abu-hardan (Nestle PTC York).

Anna Louise Macready, *The FLAVURS trial: the influence of a flavonoid-rich versus flavonoid-poor fruit and vegetable dietary intervention on cognitive function in free-living individuals at risk of cardiovascular disease*, supervised by Dr Laurie Butler (Psychology) and Dr Orla Kennedy.

OUTREACH ACTIVITIES

13th March - Chromatography Workshop for Year 12 Chemistry pupils.

Forty Year 12 chemistry pupils from Easthampstead Park School, The Forest School, Slough Grammar School, Royal Alexandra and Albert School and Brentford School attended a chromatography workshop which consisted of a practical session about the application of liquid chromatography for the determination of caffeine in cola drinks. In addition pupils were shown other chromatographic techniques including GC-MS and LC-MS.

At the end of the practical sessions pupils and teachers had an opportunity to see the different facilities and areas in the department including pilot plant, sensory sciences booths and nutrition clinical suits. The workshop was ended with an informative talk on the degrees taught in the department. The workshop has proven to be popular as several schools have already requested to attend the next one!

Other outreach activities during the Spring term have included school visits in which children have participated in various practical sessions, eg: making cheese in the pilot plant (Year 10 pupils from King Edward school, Birmingham), microbiology practical (Coombes primary school children), building roller coasters (Whiteknights primary school children with UAS project student).

FORTHCOMING EVENTS

8th-24th May 2012 – BSF Flavour Training Course

The twelfth BSF Flavourists Training Course is due to start on

8th May. This three-week programme of lectures, practical sessions and seminars is given by highly experienced flavourists from industry and university specialists. It is structured around the practical evaluation and formulation of flavourings, and has been developed by the British Society of Flavourists and the University of Reading, with support from the International Federation of Essential Oil and Aroma Trades.

This year, as usual, we are expecting participants from all over the world, with the nearest delegate coming from Ireland and the others coming from Austria, Slovenia, Germany, Russia, Mexico, Venezuela, Brazil, South Africa, USA and New Zealand! We are looking forward to some truly international and creative aromas coming from lab 4.14!



23rd May 2012 – Visit from Researchers from Wageningen University

A group of young researchers from the University of Wageningen will visit the Department for an exchange of ideas on current research topics in Reading and Wageningen.

The Group are led by Professor Tiny Van Boekel and they will be welcomed by **Professor Rastall** (Head of Department) before hearing short presentations from PhD students from Reading and from Wageningen. It promises to be a very exciting day!

RECENT PUBLICATIONS

Latest peer-reviewed publications from members of the Department of Food and Nutritional Sciences:

- Dougkas A, Minihane AM, Givens DI, Reynolds CK, Yaqoob P (2012). Differential effects of dairy snacks on appetite, but not overall energy intake.. *Br J Nutr.* 2:1-12.
- Al-Khalifa H, Givens DI, Rymer C, Yaqoob P (2012). Effect of n-3 fatty acids on immune function in broiler chickens. *Poult Sci.* 91(1):74-88.
- Vafeiadou K, Weech M, Sharma V, Yaqoob P, Todd S, Williams CM, Jackson KG, Lovegrove JA (2012). A review of the evidence for the effects of total dietary fat, saturated, monounsaturated and n-6 polyunsaturated fatty acids on vascular function, endothelial progenitor cells and microparticles. *Br J Nutr.* 107(3):303-24.
- Hidalgo M, Oruna-Concha, MJ, Kolida S, Walton GE, Kallithraka S, Spencer JPE, Gibson GR, Pascual-Teresa, S (2012). Metabolism of Anthocyanins by Human Gut Microflora and Their Influence on Gut Bacterial Growth. *J Agri Food Chem.* 60, 3882-3890.
- Rodriguez-Mateos A, Oruna-Concha MJ, Kwik-Urbe C, Vidal A, Spencer JPE (2012). Influence of sugar type on the bioavailability of cocoa flavanols. *Br J Nutr. In Press.*
- Hobbs DA, Kaffa N, George TW, Methven L, Lovegrove JA (2012). Blood pressure-lowering effects of beetroot juice and novel beetroot-enriched bread products in normotensive male subjects. *Br J Nutr.* 14:1-9
- Welderufael FT, Gibson T, Jauregi P (2012). Production of angiotensin converting enzyme inhibitory peptides from β -lactoglobulin and casein derived peptides: An integrative approach. *Biotechnol Prog. In Press*
- Halford NG, Curtis TY, Muttucumaru N, Postles J, Elmore JS, Mottram DS (2012). The acrylamide problem: a plant and agronomic science issue. *J Exp Bot. In Press*
- Brownawell AM, Caers W, Gibson GR, Kendall CW, Lewis KD, Ringel Y, Slavin JL (2012). Prebiotics and the health benefits of fiber: current regulatory status, future research, and goals. *J Nutr.* 142(5):962-74
- Fava F, Gitau R, Griffin BA, Gibson GR, Tuohy KM, Lovegrove JA (2012). The type and quantity of dietary fat and carbohydrate alter faecal microbiome and short-chain fatty acid excretion in a metabolic syndrome 'at-risk' population. *Int J Obes (Lond). In Press*
- Sánchez-Patán F, Cueva C, Monagas M, Walton GE, Gibson GR, Quintanilla-López JE, Lebrón-Aguilar R, Martín-Álvarez PJ, Moreno-Arribas MV, Bartolomé B (2012). In vitro fermentation of a red wine extract by human gut microbiota: changes in microbial groups and formation of phenolic metabolites. *J Agric Food Chem.* 7;60(9):2136-47.
- Ordidge M, García-Macías P, Battey NH, Gordon MH, John P, Lovegrove JA, Vysini E, Wagstaffe A, Hadley P (2012). Development of colour and firmness in strawberry crops is UV light sensitive, but colour is not a good predictor of several quality parameters. *J Sci Food Agric.* 92(8):1597-604.
- Chong MF, George TW, Alimbetov D, Jin Y, Weech M, Macready AL, Spencer JP, Kennedy OB, Minihane AM, Gordon MH, Lovegrove JA (2012). Impact of the quantity and flavonoid content of fruits and vegetables on markers of intake in adults with an increased risk of cardiovascular disease: the FLAVURS trial. *Eur J Nutr. In Press*
- Gordon MH (2012). Significance of dietary antioxidants for health. *Int J Mol Sci.* 13(1):173-9.
- Al-Khusaibi M, Gordon MH, Lovegrove JA, Niranjana K (2012). Provenance of the oil in par-fried French fries after finish frying. *J Food Sci.* 77(1):E32-6.
- Rendeiro C, Guerreiro JD, Williams CM, Spencer JP (2012). Flavonoids as modulators of memory and learning: molecular interactions resulting in behavioural effects. *Proc Nutr Soc.* 14:1-17.
- Spilsbury A, Vauzour D, Spencer JP, Rattray M (2012). Regulation of NF- κ B activity in astrocytes: effects of flavonoids at dietary-relevant concentrations. *Biochem Biophys Res Commun.* 17;418(3):578-83.
- Kuhnle GG, Joosen AM, Kneale CJ, O'Connell TC. Carbon and nitrogen isotopic ratios of urine and faeces as novel nutritional biomarkers of meat and fish intake. *Eur J Nutr. In Press.*
- Kuhnle GG (2012). Nutritional biomarkers for objective dietary assessment. *J Sci Food Agric.* 92(6):1145-9.
- Ottaviani JI, Momma TY, Kuhnle GK, Keen CL, Schroeter H (2012). Structurally related (-)-epicatechin metabolites in humans: Assessment using de novo chemically synthesized authentic standards. *Free Radic Biol Med.* 15;52(8):1403-12
- Charalampopoulos D, Rastall RA (2012). Prebiotics in foods. *Curr Opin Biotechnol.* 23(2):187-91.
- Osman A, Tzortzis G, Rastall RA, Charalampopoulos D (2012). BbgIV Is an Important Bifidobacterium β -Galactosidase

for the Synthesis of Prebiotic Galactooligosaccharides at High Temperatures. *J Agric Food Chem.* In press.

On-Nom N, Grandison AS, Lewis MJ (2012). Heat stability of milk supplemented with calcium chloride. *J Dairy Sci.* 95(4):1623-31.

Chen BY, Grandison AS, Lewis MJ (2012). Comparison of heat stability of goat milk subjected to ultra-high temperature and in-container sterilization. *J Dairy Sci.* 95(3):1057-63.

Pathomrungsinyounggul P, Grandison AS, Lewis M (2012).

Feasibility of using dialysis for determining calcium ion concentration and pH in calcium-fortified soymilk at high temperature. *J Food Sci.* Jan;77(1)

Hoyles L, Honda H, Logan NA, Halket G, La Ragione RM, McCartney AL (2012). Recognition of greater diversity of Bacillus species and related bacteria in human faeces. *Res Microbiol.* 163(1):3-13.

Cardelle-Cobas A, Olano A, Corzo N, Villamiel M, Collins M, Kolida S, Rastall RA (2012). In vitro fermentation of lactulose-derived oligosaccharides by

mixed fecal microbiota. *J Agric Food Chem.* 29;60(8):2024-32.

Garcia-Macias, P., Gordon, M.H., Frazier, R.A., Smith, K. & Gambelli, L. (2012) Effect of triacylglycerol composition on performance of low saturate shortenings in puff pastry. *Eur. J Lipid Sci. Technol., In press*

Roosendaal, H., Abu-hardan, M. & Frazier, R.A.(2012) Thermogravimetric analysis of water release from wheat flour and wheat bran suspensions. *J. Food Eng.*, 111(4), 606-611.
