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Abstracts of Original Communications

A Scientific Meeting was held at the University of Dundee, Dundee, 12 April 2005, when the following papers were presented.

All abstracts are prepared as camera-ready material.

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The impact of 'CookWell' on assisting dietary change in Asian young women at risk of having low birth-weight babies: qualitative findings. By K.L. BARTON¹, W.L. WRIEDEN¹, E. DEVLIN², S. MACASKILL², J.M. LAWRENCE³, M. RAATS³, ¹Centre for Public Health Nutrition Research, University of Dundee, Dundee, DDI 9SY, ²Institute for Social Marketing, University of Stirling, Stirling, FK9 4LA and ³Food, Consumer Behaviour and Health Research Centre, University of Surrey, University of Surrey, Guildford, GU2 7XH

Low income and poor diet have been cited as two of the factors associated with lower birth weights in South Asian compared to Caucasian infants (Thomas, 2002). Poor diet is often linked to deprived communities where food choice may be limited by a range of factors including cost, access, cultural norms, low confidence and poor skills in food preparation (Department of Health, 1999). The 'CookWell' programme (commissioned by the Food Standards Agency) was undertaken to develop, implement and evaluate a transferable, community-based, practical food skills programme aimed at increasing consumption of starchy foods, fish, vegetables and fruits, and decreasing consumption of fat in adults living in areas of deprivation (Wrieden *et al.*, 2002).

The present study aims to assist women (at risk of having low birth-weight babies) from low-income and ethnic minority backgrounds to achieve healthier food choices through a food skills intervention programme. The data presented is from the South Asian intervention group convened in Dundee, Scotland.

The intervention design and delivery was informed by focus group discussions. This formative work indicated confidence with traditional cooking, but raised concerns over recipe use and adaptation of traditional food practices to incorporate healthier food habits which are consistent with family taste preferences and religious food codes. Using this information the CookWell programme was adapted, incorporating 'healthier' Asian dishes but retaining flexibility for other communities. Following the intervention programme, subjects then undertook qualitative (focus group) discussions. Participants knowledge, beliefs and attitudes towards food choices together with 3x24 hour recalls were carried out pre- and post-intervention and will be reported separately.

Respondents participating in post intervention focus group work reported that they had gained inter-personal and social skills from course participation; improving self-confidence and self assurance within a supportive learning environment. A range of new skills were reported including using unfamiliar equipment (e.g. steamers), using basic ingredients instead of ready-prepared packets/tins (with potential to lower sodium intake) and new and modified recipes. The dishes prepared included modifications of traditional ethnic cuisine ("when I cook Biryani I put lots of oil in and now I got recipe and I just put a little oil"), and were reported to widen food taste horizons ("I had never used cabbage") and teach about successful modifications of cooking procedures ("I've realised you don't have to overcook things"). At the request of participants, Western dishes e.g. soup, pasta, pizza were included as part of the programme and it became apparent that these were being used at home to supplement the traditional evening meal rather than replace traditional food. There were several accounts of how the course information had been communicated, discussed and exchanged within wider family networks including husbands, sister-in laws and mothers. Participants reported that the process of 'doing' appeared to be an important part of the learning process and that a number of food misconceptions about low fat foods having low taste had been dispelled.

In conclusion, a range of practical food skills can be successfully introduced and taught within an ethnic minority group context with the potential to influence a wide network of family and friends.

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 Wrieden WL, Anderson AS, Longbottom PJ, Valentine K, Stead M, Caraher M, Lang T & Dowler E (2002). Assisting dietary change in low-income communities: assessing the impact of a community-based practical food skills intervention (CookWell). Final Technical Report to Food Standards Agency.

Reported fruit and vegetable intake of 50 children aged 11-13 in Dundee, Scotland. By K.L. BARTON¹, C. THOMSON², E. BURROWS¹, L. REID³, A.S. ANDERSON¹, G. LIETZ² and P.J. LONGBOTTOM⁴, ¹Centre for Public Health Nutrition Research, University of Dundee, Dundee, DDI 9SY, ²Department of Biological and Nutritional Sciences, University of Newcastle Upon Tyne, Newcastle, NE1 7RU, ³School of Contemporary Sciences, University of Abertay, Dundee, DDI 1HG and ⁴Arbroath Infirmary, Arbroath, DDI 2AT

Dietary habits in childhood impact on growth, development and current health and also influence adult health. If good eating patterns are established in childhood, it is likely that they will be continued into adulthood (Scottish Office, 1996). High intakes of fruits and vegetables are associated with lower rates of chronic diet related diseases including coronary heart disease and certain cancers (Block *et al.* 1992). Adolescent intakes of fruits and vegetables in Scotland are, however, well below the population recommended minimum of 400 g per day (which has generally been translated into 5 portions of approximately 80 g) (Gregory *et al.* 1989).

The aim of the present study is to report the fruit and vegetable intake of fifty 11-13 year olds who took part in an EPIC food frequency validation (EPIC FFQ) study (Lietz *et al.* 2002).

Sixty-seven school children (11-13 years) took part in the study which involved completing a 7-day weighed dietary record (7d WDR) and EPIC FFQ. Reported fruit and vegetable intake was recorded from the completed 7d WDRs. Proportions of fruit and/or vegetables in composite meals were either calculated from recipes provided by subjects, standard recipes (FSA, 2004) or ingredient lists on packets. Subjects' mean total fruit and vegetable intake and adjusted intake (maximum of one 80 g portion of fruit juice and pulses per day) were calculated.

Fifty subjects successfully completed the 7d WDR. Although nutrient analysis suggested that 12 subjects had under-reported (Strain *et al.* 1994), it is unlikely that individuals would under-report their fruit and vegetable intake so data are presented for 50 subjects. Fruits consumed most frequently were fruit juice, apples, oranges and bananas; these were most commonly eaten as snacks. Salad vegetables (lettuce, tomato and cucumber) were the most frequently consumed vegetables, mainly in sandwiches, followed by vegetables in composite meals. The most frequently consumed vegetable as an accompaniment was baked beans followed by carrots and peas. Vegetables were rarely consumed at breakfast or as a snack. Median total fruit and vegetable intake was a third of the recommended 400 g per day, with adjusted intake equaling one portion. These intakes are similar to the 11-18y Scottish sample of the 4-18 National Diet and Nutrition Survey (Wrieden *et al.* personal communication).

		Fruit (g)	Vegetables (g)	Fruit & Vegetables (g)
Total Daily Intake (g)	Males (n 18)	55.0 (20.7-223.0)	60.5 (37.6-105.6)	128.0 (72.7-307.2)
	Females (n 32)	77.8 (18.0-294.7)	50.0 (19.7-97.3)	135.0 (83.8-371.5)
	All (n 50)	73.7 (20.7-239.8)	52.1 (27.7-99.9)	133.8 (81.4-323.1)
Adjusted Daily Intake (g)	Males (n 18)	38.5 (20.7-132.7)	54.0 (35.4-87.4)	84.0 (57.2-224.1)
	Females (n 32)	57.1 (18.0-168.5)	45.4 (19.7-92.5)	89.9 (51.8-236.7)
	All (n 50)	53.4 (20.7-139.5)	50.0 (27.2-92.0)	86.6 (57.2-224.1)

Results from this study reveal that this sub-group of the population, with high nutritional needs, are far from reaching a 400 g intake of fruit and vegetables per day and, as such, interventions are appropriate and timely. These data were collected prior to the publication and subsequent local authority response to the Hungry for Success policy (Scottish Executive, 2002), which should assist in increasing the intake of fruits and vegetables in this age group.

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Isoflavone content of soya-based beverages and desserts. By L.J. MACKINNON¹, A. BLAKE², M.R. RITCHIE¹ and A.C. RICHES¹, ¹Bute Medical School, University of St Andrews, West Burn Lane, St Andrews, UK, KY16 9TS and ²The Scottish Crop Research Institute, Invergowrie, UK, Dundee DD2 5DA

The aim of the present study was to measure the isoflavone (genistein and daidzein) content of commonly available soya products such as flavoured soya milks and desserts. These products are commonly used as substitutes for cows' milk by individuals with IgE-mediated cows' milk allergy, lactose intolerance and galactosaemia. Since genistein and daidzein are phyto-oestrogens (and therefore may produce physiological effects in human subjects), it is important to assess their variation in foods which are commonly consumed and which contain soya.

A range of soya-based beverages and desserts were assayed for genistein and daidzein content using liquid chromatography with mass spectrometric detection.

Product	Genistein content (µg per 100 g)	CV	Daidzein content (µg per 100 g)	CV
Fermented soya beverage (Haolan 951) (n 9)	10 090	13	11 837	8
Strawberry and banana flavour drink (Soy & Joy) (n 3)	211	26	445	7
Forest fruit flavour drink (Alpro) (n 3)	437	27	275	9
Chocolate flavour dessert (Alpro) (n 2)	488	9	491	5
Vanilla flavour dessert (Alpro) (n 2)	1819	11	582	3

Genistein content ranged from 211 to 10 090 µg/100 g and daidzein content ranged from 27 to 11 837 µg/100 g. The isoflavone content of these foods is low by comparison with rich sources of phyto-oestrogens such as tofu (12 874 µg/100 g), low-fat soya flour (21 1700 µg/100 g) and soya-based infant formulas (2000 µg/100 g) (Ritchie, 2003). Soya-based infant formula is often used for infants with a cows' milk allergy or intolerance. Average isoflavone intake in the UK is in the region of 3 mg/d (Clarke & Lloyd, 2004), so regular consumption of these soya-based beverages and desserts may make a significant contribution to habitual phyto-oestrogen intake.

Intake of phyto-oestrogens in the pre-pubertal phase may have the most pronounced influence on health (Peeters *et al.* 2003) and exposure over a lifetime may produce effects that are not apparent from shorter-term consumption (Adlercreutz, 2003). Therefore it is conceivable that the replacement of milk-based products with soya-based products by milk-allergic individuals may have implications for their health in the long term.

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Development of a novel biomarker of dietary inorganic sulfur intake. By R. CURNO, E.A.M. MAGEE, L.M. EDMOND, S.M. TASKER and J.H. CUMMINGS, *Division of Pathology and Neuroscience, Ninewells Hospital and Medical School, University of Dundee, Dundee, UK, DDI 9SY*

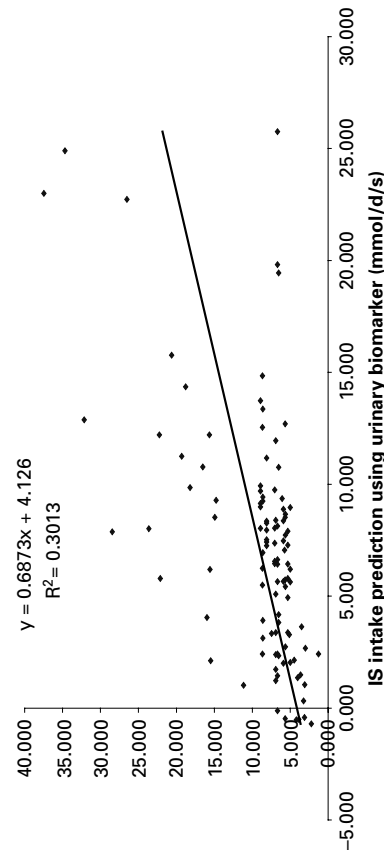
Interest in the biology of S compounds has increased with the observed link between S intake, sulfide production and the inflammatory bowel disease ulcerative colitis. The main sources of S in the diet are organic S (OS) from S amino acids, and inorganic S (IS) mostly arising from sulfiting agents (E220–E228), which are widely used food additives. Recent observations suggest that sulfiting agents are consumed in excess of the ADI.

Sulfate in urine is the product of both OS (protein) and IS intake. We have sought to validate the hypothesis that the urinary N:sulfate ratio can be used to predict IS intake. The biomarker was used to predict IS intake from the analysis of urines collected from two previous studies. In both studies volunteers were on a steady-state intake of IS. IS intakes were noted at 1.2–8.9 mmol S/d (Magee *et al.* 2004).

A further study was devised to look at the accuracy of the biomarker over a wider range of IS intakes (9–20 mmol S/d). Twenty subjects aged 18–50 years, with high IS intake, were recruited. The study ran for 24 h, with subjects consuming a selection of high-IS foods. These foods included red or white wine and beer (4–5.7 mmol S/kg), dry-roasted groundnuts (6.8 mmol S/kg), processed meat products (7.8 mmol S/kg), dried potato (28.86 mmol S/kg) and dried apricots (44.5 mmol S/kg). Duplicate diets and 24 h urines were collected and analysed for sulfate and sulfite; by ion exchange chromatography (Edmond *et al.* 2003) and N. PABA was used as a marker to validate the completeness of the urines (Bingham & Cummings, 1983). A factor of 18.89 is applied to the urinary N measurement, to predict the IS content of the diet. The factor was derived from the average S:N ratio from a range of typical UK diets (Magee *et al.* 2004). Subtracting OS from urinary sulfate indicates the IS content of the diet.

The results show a good prediction of IS consumed over a wide range of IS intakes. Urinary N and sulfate are together a biomarker of the intake of sulfiting agents

All study data for prediction of IS intake vs actual dietary IS content



Further work is in progress to determine faecal and renal handling of S.

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Knowledge and attitudes of parents of young children in four European countries about food allergy and health. By K. SYNOTT¹, J. BOGUE¹, J. SCOTT², S. AMARRI³, F. BENATTI³, D. FRIAS⁴, A. GIL⁴, A. UUSJÄRVI⁵, E. NORRIN⁵, C.A. EDWARDS² and other members of INFABIO project, ¹Department of Food Science, Food Technology, and Nutrition, National Food Biotechnology Centre, University College Cork, Western Road, Cork, Republic of Ireland, ²Human Nutrition Section, University Division of Developmental Medicine, Yorkhill Hospital, Glasgow, UK, ³G3 8SJ, ⁴Department of Paediatrics, University of Modena and Reggio Emilia (UMRE), Via del Pozzo, 71, 41100 Modena, Italy, ⁵Department of Biochemistry and Molecular Biology, Faculty of Pharmacy, Department of Microbiology, Laboratory of Microbial Taxonomy and Department of Paediatrics, University of Granada, Campus de Cartuja, 18071 Granada, Spain and ⁵Microbiology and Tumor Biology Centre (MTC), von Eulers väg 5, Karolinska Institutet, 171 77 Stockholm, Sweden

There are many differences in diet and lifestyle across Europe. Patterns of food allergy also differ. Therefore, identification of foods and feeding practices associated with knowledge and attitudes to food allergy in infants is important, especially with the heightened consumer awareness of the links between diet, health and nutrition. The objectives of the present consumer study were: (i) to analyse consumers' attitudes to foods associated with infant allergy and (ii) to explore the viewpoints of parents with respect to infant diet, health and allergies. Parents of infants up to the age of 12 months in Italy, Spain, Scotland, and Sweden completed a total of 252 questionnaires. Respondents were recruited in each country in postnatal wards. Parents were asked to complete the pre-tested consumer questionnaires before the introduction of solid food to the infant's diet. The questionnaire was developed in Cork in collaboration with other partners, pre-tested and translated into local languages. It asked about foods mothers avoided during pregnancy, and their knowledge of foods associated with allergy.

The majority of respondents chose cows' milk and shellfish as the most common foods associated with infant allergy. Parents from all countries were not aware of any meat or vegetable products linked with allergy. Strawberries were indicated as being the most common fruit associated with allergy, while all respondents also linked gluten to allergies in infants. Other foods were associated with allergy and these were specific to parents in each country: peaches in Spain (57%) and tomatoes in Sweden (62%). Other food products specific to each country were groundnuts in Scotland (92%), tree nuts in Sweden (90%) and eggs in Spain (79%). Respondents in all countries agreed that breast-feeding prevented allergies in infants but that pollution contributed to allergies in infants. All respondents were of neutral opinion that introducing solids at an early age encouraged allergies to develop. All respondents disagreed, with the exception of Spanish respondents who remained neutral, that allergies were genetically inherited only. In Scotland, 44% of parents agreed that cows' milk consumption before the age of 1 year contributed to allergies; however, both Spanish (61%) and Italian (42%) participants disagreed that cows' milk consumption after the age of 1 year contributed to allergies. Spanish parents disagreed (60%) that too early exposure to the sun contributed to allergies in infants. Swedish parents (55%) agreed that a little dirt prevented allergies in infants but 58% disagreed that having an overly clean house prevented allergies in infants.

This preliminary study has shown that there are important differences in attitudes towards infant foods and environmental factors associated with allergy between countries. These findings highlight the importance of exploring cultural differences and similarities among a European population to help provide correct information relative to their cultural needs.

This work (project QLRT 2002 02606; INFABIO) was carried out with financial support from the EU Commission. It does not necessarily reflect its views and in no way anticipates the Commission's future policy in this area.