



PLENARY ABSTRACTS

Presented Monday May 31, 2004

Session Title: **Roots to Food Security (A Sustained Community-Led Initiative Tackling Community Food Issues in Scotland)**

Speakers: **John Brennan**

Scotland

Scotland is a country of around 5 million people inhabiting the northern portion of the west European island known as the United Kingdom, which was in turn formerly known as Great Britain. The United Kingdom is a key partner in the G7/G8 group of nations, confirming its status as one of the most powerful national economies on the planet.

Since 1999 Scotland has had its own devolved parliament, re-establishing a tradition that ceased in 1707 with the Act of Union when the country's governance was subsumed by its more powerful neighbour, England. Scotland has long held a strong sense of national identity. The contribution made by Scots historically in the fields of medicine, science and technology, and literature is greatly disproportionate to its size, the population being around one tenth of neighbouring England. Certain aspects of Scottish culture are globally recognisable. Whisky, kilts and Sean Connery being prime examples.

Food in Scotland

Other aspects of Scottish culture travel less well. Although Scottish natural produce, such as beef, shellfish, venison, berries and wild salmon grace some of the most sophisticated tables on the planet, indigenous Scottish cuisine does not on the whole enjoy a good reputation. Scots are much more likely to be regarded as voracious consumers of almost anything that can be deep fried, or ritualistically devouring concoctions comprising the parts of animals that most other civilised people would discard in honour of long dead poets.

This simplistic view, though not entirely without some grain of foundation, obfuscates some of the complex reasons that Scots suffer from poor health related to diet at a level that gives the population a health profile among the worst in Europe and comparably developed nations.

Addressing food issues from a community perspective

Throughout the 1990s a number of community activists involved in local food co-operatives around the city of Edinburgh, Scotland's capital and home to the largest arts festival on the planet, were struggling to make an effective impact on the lack of access

to affordable food within their neighbourhoods. Few available resources and little cohesive support meant ongoing difficulties in addressing the issues that contributed to premature mortality rates that could create a difference of up to ten years in life expectancy, as well as to the quality of that shorter life span, depending on where you lived and what your income was.

In recognition of this, the community activists with the support of neighbourhood based community workers successfully applied for funding from public sources to establish a unique citywide community food initiative that would support local communities to address critical food security issues. The Edinburgh Community Food Initiative (ECFI) was launched in May 1996.

The local political climate

The project was launched at the end of a transatlantic political cycle that had been initiated and characterised by the Reagan/Thatcher administrations. But this was a time when Scotland's dietary health had recently been examined and contextualised by a government report that led to a new national Diet Action Plan. The problems of the Scottish diet, which had largely been seen up till then as fodder for newspaper cartoonists in their lampooning of 'The Dying Scotsman', were beginning to be taken seriously as a valid issue to be resourced and addressed.

The electoral changes around 1997 in the UK, as well as similar shifts in the USA and France, from right wing to more centerist parties in power, opened up the rhetorical possibilities that would lead a more incisive examination of the socio-economic context of health issues. Health inequalities and the effect of poverty on health were less taboo and now valid perspectives informing strategies to impact on the nation's poor health.

Practical Action

The key aspect of ECFI's work over the last eight years is practical action. ECFI provides support for and development of practical, tangible initiatives that impact on local food security issues.

The project's methodology has become widely recognised as being effective and valid in addressing the root causes and effects of poor health in relation to dietary factors.

The success of the PROVIDE and PROMOTE approach of the project has resulted in a raised awareness of issue among both communities and policy makers.

This Session will provide:

An insight into food and health issues in current Scottish culture, including factors that assist and inhibit positive dietary change for individuals and communities in relation to socio-economic status.

Allow an insight into practical examples of local strategies, policies and, above all, actions that have been carried out to enable greater access to the means to an adequate and healthy diet for people living in low-income circumstances in an urban environment.

Provide information on how community based work in one country relates to work in many others, linked by national and global food, health and trade policies.

Insight into how ECFI's programmes address issues such as: Children going hungry, mothers missing meals, reliance on the cheapest pre-prepared processed foods, lack of variety and lack of balance in the regular diet that results in a potentially disastrous level of type 2 diabetes, tooth decay and obesity.

An understanding of the barriers to healthier diet for people living in low-income circumstances.

Conclusion

The presentation will give an insight into a unique food and health project. There are few comparable initiatives that have been operating for the period of time that ECFI has, that have a citywide remit, as well as such a broad based approach.

The initiative's work is essentially practical, in that it has a long-term perspective and is action based. The initiative is an example of how local communities can, having identified food insecurity as a key health issue, initiate and oversee an action that directly addresses this issue. The initiative's partnership working approach, that involves both communities and professionals from a multi-disciplinary background including community workers, health visitors, dietitians, schools, nurseries, public health practitioners (and increasingly, local food producers and distributors), reveals how workers and individuals from a range of agencies can engage effectively in addressing local food and health issues, particularly in working with people living in areas of socio-economic disadvantage.

A longitudinal examination of the work of the Food Initiative provides an insight into how the process of dealing with the fundamental issues of food access can be developed into a broader context and take cognisance of, and incorporate action on matters relating to health, influencing policy, and politics, both in a local context as well as on a wider scale.

The initiative's development in recent times in the fields of community supported agriculture, primary school and nursery school food and health initiatives, global and local ethical trading initiatives and local food economy networks make it a unique and dynamic example of the impact that local people can make on a diverse and complex local and global health issue.

Session Title: **Spotlight on Population-Based Approaches to Nutrition Monitoring and Surveillance**

Speakers: **Catherine Wotecki, Winsome Parnell**

Title: **National Nutrition Surveys in New Zealand: Methodological Developments**

Authors: **Parnell WR, Wilson NC, McKenzie J, Wohlers M.**

Two Government funded National Nutrition Surveys have been undertaken in New Zealand recently. The adult survey was undertaken in 1997 (NNS97) and the children's survey in 2002 (CNS02). Their primary purpose was to: monitor food and nutrient intake and assess dietary adequacy, contribute to food and nutrition policy development and monitor the impact of policy, influence policy and regulations in food safety and food composition, and provide food and nutrient intake data suitable for risk assessment and monitoring of the regulatory food policies governing fortification and contaminant levels.

Methodological challenges were posed by the demography of New Zealand (ethnic diversity and widely spaced rural communities), by cost ceilings and by recent developments in dietary assessment, and assessment of food security.

The issues and challenges in the following areas of methodology will be discussed:

- From the 24-hour diet recall: Assessment of levels of fortified nutrients in foods and the influence on statistical adjustment of nutrient intake data for intra-individual variation
 - Development of and interpretation of indicators of food security.
 - Development of the concept of food combinations.
1. The 24-hour diet recall nutrient intake data were adjusted for intra-individual variance to provide 'usual intake' for population sub-groups using C-SIDE-software (developed by Iowa State University). Obtaining repeat 24-hour diet recalls from a sub-sample, across all population sub-groups was a logistical challenge. In the CNS02, nutrient intake data included 24-hour intake from both foods and dietary supplements thereby skewing the data, and increasing the difficulty of producing 'usual' intake. The fortification regulations changed during the duration of both the NNS97 and CNS02 providing a difficult environment to monitor brands consumed and assess nutrient levels claimed to be present. From the adjusted

nutrient intake data, it was possible to calculate probability of inadequate intake for selected nutrients, however, ensuring appropriate interpretation of these data was complex.

2. It was necessary to develop indicators of household food security which would be culturally appropriate and not pose undue respondent burden. Eight indicators were developed informed from the literature and by focus group research. It was possible to use these across the sample without prior screening for socio-economic status. Current work on these indicators for 'severity ranking' and 'predictive powers' (with respect to food and nutrient intake) is progressing.
3. Nutrition education encompasses advice on food choice. To enrich this area, documenting common 'food combinations' was attempted. This was particularly successful for breakfast items: beverages, breakfast cereals and bread/toast and not always possible for food items often consumed away from home. The data enabled robust assessment of the discretionary use of fat spreads with respect to types and amounts and contribution to total fat intake.

Bibliography

- Parnell, W. R., Scragg, R. K. R., Wilson, N. C., Schaaf, D., & Fitzgerald, E. D. H. (2003). NZ Food: NZ Children: Key results of the 2002 National Children's Nutrition Survey. Wellington: Ministry of Health, New Zealand. <http://www.moh.govt.nz>
- Parnell, W. R., Wilson, N. C., & Russell, D. G. (2001). Methodological advances in the 1997 NZ National Nutrition Survey. *New Zealand Medical Journal*, 114, 123-126.
- Russell, D. G., Parnell, W.R., Wilson, N. C. et al (1999). NZ Food: NZ People. Key Results of the National Nutrition Survey. Wellington: Ministry of Health, New Zealand. <http://www.moh.govt.nz>
- Simpson F., Parnell W. R., Wilson N. C., New Zealand Food Habits: Butter and margarine additions. *Journal of NZ Dietetic Association*, 56, 1, 14-19, 2002.

Session Title: Spotlight on Population-Based Approaches to Nutrition Monitoring and Surveillance

Speakers: Catherine Wotecki, Winsome Parnell

Speaker name: Catherine E. Woteki, Ph.D., R.D.

Session title: Population-Based Approaches to Nutrition Monitoring and surveillance – Part I

- I. Nutrition Monitoring and Surveillance Systems in the United States
 - A. Food Availability and Consumption
 - B. Food Composition Data Bases
 - C. Nutrition Status Assessments
 - D. Related Health Status Measures
 - E. Knowledge, Attitudes and Behaviors

- II. Uses of Nutrition Monitoring and Surveillance System Data
 - A. National Policy
 - i. Monitoring and surveillance examples:
 - trends in food intake and risk factors (e.g., trends in iron status; trends in dietary patterns and overweight/obesity; relationships between diet and trends in overweight/obesity)
 - trends in the occurrence of disease (e.g., trends in cardiovascular risk factors – elevated serum cholesterol levels, hypertension, diabetes, overweight, high total fat and saturated fat intakes)
 - trends in household food security
 - current and future safety of the food supply (e.g., monitoring the exposure to methyl mercury in fish; monitoring the exposure to bacteria in uncooked hot dogs).
 - Healthy People 2010
 - evaluation of compliance with the Dietary Guidelines
 - post-market surveillance (e.g., infant formula)
 -
 - ii. Regulatory examples:
 - food security/safety – i.e., protection from pesticides, infection (e.g., salmonella), and contaminants (e.g., mercury levels in seafood).
 - food fortification policy (e.g., the Food and Drug Administration is requiring that folic acid be added to specific flour, breads and other grains to help prevent neural tube defects)
 - food labeling and Nutrition Facts – used survey data to define what serving sizes should be on foods for labeling purposes
 - iii. Nutrition-related programs examples:
 - dietary guidelines (i.e., Dietary Guidelines for Americans and the Food Guide Pyramid – their development requires survey data

- integrated health programs (i.e., National Cholesterol Education Program, National Blood Pressure Program)
- food assistance programs (i.e., Food Stamps, Supplemental Food Program for Women, Infants and Children, School Breakfast, School Lunch) – they utilize nutrition monitoring data to assess the nutritional impact of the programs on participants

B. Scientific research examples:

- Cross-sectional and longitudinal studies of relationships of food intake or supplement use to nutrient status, health status, occurrence of disease, and overall mortality (e.g., examination of fat-soluble diet components and common age-related degenerations in the eye)
- Relationship of serum concentration of folate and neural tube defects or cardiovascular disease
- Identification of appropriate biomarkers of nutritional status
- Research to study welfare reform and food stamps
- Research to study food security

C. Establish population-based (normative data) standards examples:

- U.S. Growth Charts
- nutritional biochemistry (biomarkers)
- nutrient requirements through the life cycle (development and evaluation of Dietary Reference Intakes)

III. New Applications of Nutrition Monitoring and Surveillance System Data

A. Quantitative Risk Assessment

B. Dietary Reference Intakes

IV. Conclusion

A. National monitoring and surveillance systems are essential to science-based decisions informing public policies on nutrition and food safety.

B. Risk assessments and other analyses based on national nutrition monitoring and surveillance systems will play an ever greater role in international decisions such as those made by the Codex Alimentarius Commission and the World Trade Organization affecting trade in food and food supplements.

Session Title: **The Pros and Cons of the Glycemic Index**
Speakers: **Marion J. Franz, Adri Vermeulen**

Glycemic Index – Pros and Cons

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In the 2002 American Diabetes Association technical review and position statement, Evidence-Based Nutrition Principles and Recommendations for the Treatment and Prevention of Diabetes and Related Complications, recommendations are classified according to the level of supporting evidence (1,2). A major section reviews the role of carbohydrates, including the glycemic index (GI), in the food and meal planning for persons with diabetes.

Perhaps the most widely held belief in regard to carbohydrates and diabetes has been the assumption that the response to food carbohydrates was based on the chemical composition, e.g., sugars versus starches. However, ~20 studies have reported that when subjects are allowed to choose from a variety of starches and sugars, the glycemic response is identical as long as the total amount of carbohydrate is kept constant. Therefore, it is concluded that with regard to the effects on glucose concentrations, the total amount of carbohydrate in meals and snacks is more important than the source (starch or sugar) or the type (high or low GI). The first priority for food and meal planning is the total amount of carbohydrate that the person with diabetes chooses to have for meals or for snacks. Individual receiving intensive (flexible) insulin therapy can adjust their premeal rapid-acting insulin according to the amount of carbohydrate they plan to ingest (3,4) and individuals using fixed insulin regimens need to be consistent in day-to-day carbohydrate intake (5).

A number of factors influence the glycemic response to food, including the amount of carbohydrate, type of sugar, nature of the starch, cooking and food processing, particle size, food structure, other food components (fat and natural substances that slow digestion), as well as the fasting and preprandial glucose concentrations, severity of glucose intolerance, and the second meal or lente effect. Although different carbohydrates do produce differing glycemic responses, to be of benefit clinically this benefit should translate into long-term improvements in glycemia or lipids. Examining the data reveals no clear trend in outcome benefits. If there is an effect on long-term glycemia, it is modest at best (6). There is insufficient evidence at this time of long-term benefit on glycemia, lipids, and weight loss to recommend diets with a low glycemic index as a primary meal planning approach. A recent meta-analysis of glycemic index diets in persons with diabetes reported a reduction in A1C by ~0.4% units (a 7.4% decrease) from low GI-diets compared to high GI-diets and a reduction in A1C from baseline by 0.35% (7). However, randomized controlled trials and observational studies of other nutrition interventions for diabetes have reported decreases in A1C of 1% to 2% units (a 15-22% decrease in A1C) (8). Therefore, it is suggested that interventions demonstrated to have the greatest effect on overall glycemic control be implemented first. Individuals with diabetes can use pre-and postmeal blood glucose monitoring to fine-tune their food choices.

As defined the GI takes only into account the type of carbohydrate and ignores the total amount of carbohydrate in a typical serving, although both the type and amount of carbohydrate influence the postprandial glycemic and insulin response of a given ingested food (9). Furthermore, there is considerable variability in blood glucose response to any food item, both within individuals and between individuals (ranging from 23% to 54%) (9,10). It is also reported that the postprandial insulin response to isoenergetic amounts of foods was not closely related to either the carbohydrate content or the glycemic effect of food; the glycemic response accounted for only 23% of the variability in plasma insulin (11). The GI also only measures glucose above

the beginning fasting glucose and only for 2 hours. If it measured what occurs naturally, the fasting glucose value would decrease over time and area under the curve (AUC) would be greater. If the AUC is calculated in this manner, the differences in GIs between foods are greatly attenuated (9).

Until research demonstrates long-term benefits for people with diabetes of the glycemic index, making food choices should be kept as easy and simple as possible. Understanding what foods are carbohydrates, knowing portion sizes, and knowing how many servings to select for meals and, if desired for snacks, will benefit the majority of person with diabetes, and can increase variety and flexibility in food choices.

References:

1. American Diabetes Association: Evidence-based nutrition principles and recommendations for the treatment and prevention of diabetes and related complications (Position Statement). *Diabetes Care* 2002;25:202-212.
2. Franz MJ, Bantle JP, Beebe CA, Brunzell JD, Chiasson J-L, Garg A, Holzmeister LA, Hoogwerf B, Mayer-Davis E, Mooradian A, Purnell JQ, Wheeler M: Evidence-based nutrition principles and recommendations for the treatment and prevention of diabetes and related complications (Technical Review). *Diabetes Care* 2002;25:148-198.
3. Rabasa-Lhoret R, Garon J, Langelier H, Poisson D, Chiasson J-L. The effects of meal carbohydrate content on insulin requirements in type 1 diabetic patients treated intensively with the basal bolus (ultralente-regular) insulin regimen. *Diabetes Care*. 1999;22:667-673
4. DAFNE Study Group. Training in flexible, intensive insulin management to enable dietary freedom in people with type 1 diabetes: dose adjustment for normal eating (DAFNE) randomized controlled trial. *BMJ* 2002;325:746-752
5. Wolever TMS, Hamad S, Chiasson J-L, et al. Day-to-day consistency in amount and source of carbohydrate intake associated with improved glucose control in type 1 diabetes. *J Amer Coll Nutr*. 1999;18:242-247.
6. Franz MJ. Carbohydrate and diabetes: is the source or the amount of more importance. *Current diabetes Reports* 2001;1:177-186.
7. Brand-Miller J, Hayne S, Petocz P, Colagiuri S. Low-glycemic index diets in the management of diabetes: a meta-analysis of randomized controlled trials. *Diabetes Care* 2003;26:2261-2267.
8. Franz MJ. The glycemic index. Not the most effective nutrition therapy intervention. *Diabetes Care* 2003;26:2003-2005.
9. Pi-Sunyer FX. Glycemic index and disease. *Am J Clin Nutr* 2002;76:290S-298S.
10. Wolever TM, Vorster HH, Bjorck I, Brand-Miller J, Brighenti F, Mann JI, Ramdath DD, Granfeldt Y, Holt S, Petty TL, Venter C, Xiaomei W. Determination of the glycemic index of foods: interlaboratory study. *Eur J Clin Nutr* 1998;52:924-928.
11. Holt SH, Miller JC, Petocz P. An insulin index of foods: the insulin demand generated by 1000-kJ portions of common foods. *Am J Clin Nutr* 1997;66:1264-1276

Session Title: The Pros and Cons of the Glycemic Index
Speakers: Marion J. Franz, Adri Vermeulen

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Since the discovery of the glycemic index (G.I.) concept in 1981(1), many research studies have been conducted to investigate the role of the G.I. and disease. Low G.I. diets are more beneficial to health than high G.I. diets. Despite a controversial start, the concept is now well recognised on an international scale. The incorporation of the glycemic index in dietary advice is supported and recommended by the Food and Agricultural Organisation of the United Nations (2), the World Health Organisation (2), the European Association for the Study of Diabetes (2), the Canadian Diabetes Association (2), the Dietitians Association of Australia (2) and the Nutrition Sub-Committee of the Diabetes Care Advisory Committee of Diabetes UK (3).

The discussion on the pros of the G.I. will focus on the role of the glycemic index in the prevention of type 2 diabetes and how the G.I. will affect glycemic control and the management of heart disease and obesity.

Epidemiological studies have shown that overall glycemic load (the product of the glycemic index of a food and the amount of carbohydrate in a serving), is an independent risk factor for type 2 diabetes (4,5). Glycemic load and glycemic index was associated with risk of developing type 2 diabetes, but total carbohydrate intake was not (5). One of the best predictors of type 2 diabetes is hyperinsulinaemia, a manifestation of insulin resistance (5). Doubling or tripling the glycemic load, doubled or tripled the insulin (AUC) with no sign of a threshold (6). This indicates that diets with a high glycemic load have a physiological basis for predicting the risk of type 2 diabetes (6). Individuals at risk of developing type 2 diabetes, for example those with a family history of diabetes, a history of gestational diabetes, impaired glucose tolerance and the presence of obesity need to be informed about the benefits of basing their diet on low glycemic index diets to lower their risk.

Any reduction in HbA1C in people with diabetes will improve prognosis (7). A meta-analysis of 14 studies have shown that low G.I. diets will reduce glycosylated proteins by an additional 7 or 8% over and above that seen with high G.I. diets (7). The type as well as the amount of carbohydrate will affect postprandial blood glucose levels (8). People with diabetes have a choice to either change the amount, or type of carbohydrate, (for example exchanging low G.I. foods for high G.I. foods), to improve glycemic control.

By following a low G.I. diet, people with diabetes can reduce their risk of developing heart disease. Low G.I. diets will cause an increase in HDL cholesterol (9). Total cholesterol and LDL-cholesterol were significantly reduced after a low G.I. compared with a high G.I. diet and plasminogen activator inhibitor 1 was 58% reduced after a low G.I. diet but unchanged after a high G.I. diet (10).

The majority of adults and adolescents with type 2 diabetes are overweight. Dietary intervention should aim to facilitate lifestyle changes and prevent the recurrence of weight gain. Low fat, high carbohydrate diets can have detrimental effects on plasma glucose, insulin, triglycerides, HDL or fibrinolysis when carbohydrate foods with a high glycemic index are consumed (11). These adverse effects are abolished if the diet is based largely on fibre – rich, low glycemic index foods (11). Energy restricted low G.I. diets caused more weight loss than energy restricted high G.I. diets. (12). When energy intake was not restricted, an ad libitum low G.I. diet caused more weight loss than a low fat, energy restricted diet (13). A low G.I. diet should therefore be considered as a way of helping people with diabetes to lose weight without compromising glycemic control.

Counselling patients on the glycemic index concept has been perceived as complicated and there is a concern that information on the glycemic index concept will dilute other important dietary messages. However, clinically significant improvements in relevant end points have been reported amongst individuals consuming self-selected low G.I. diets (14). Low G.I. advice was perceived as "simple and practical" (15). When information on the glycemic index was simplified, knowledge about the G.I. increased significantly without changing previous, (correct) healthy eating beliefs (16). The discussion on the pros of the glycemic index concept will therefore also concentrate on the practical application of the glycaemic index concept to equip professionals who would like to incorporate the glycemic index in dietary advice with guidelines to do so. Issues that will be addressed will be:

- ❑ how to simplify the G.I. concept during a dietary consultation,
- ❑ how portion control will affect G.I. values,
- ❑ how to incorporate the G.I. into healthy eating messages

The ability of a low G.I. diet to improve blood glucose control, lipid profile and its role in the management of obesity, cannot be ignored. To base the dietary treatment of diabetes on healthy eating guidelines alone is no longer acceptable. The concept of the glycemic index *should* be incorporated into healthy eating advice.

References:

1. Jenkins, D.J.A et.al (1981): Glycemic index of foods: a physiological basis for carbohydrate exchange. *The American Journal of Clinical Nutrition* **34**: 362 –266
2. Foster- Powell, K et.al (2002): International tables of glycemic index and glycemic load: 2002. *American Journal of Clinical Nutrition* **76**: 5-56
3. Nutrition Sub-committee of the Diabetes Care Advisory Committee of Diabetes UK (2003): The dietitians challenge: the implementation of nutritional advice for people with diabetes. *Journal of Human Nutrition and Dietetics* **16**: 421- 452.
4. Salmeron, J et.al (1997): Dietary fiber, glycemic load and risk of NIDDM in men. *Diabetes Care* **20**: 545 -550
5. Salmeron, J. et.al (1997): Dietary fiber, Glycemic load and risk of non-insulin dependent Diabetes Mellitus in women. *Journal of the American Medical Association* **277** (6): 472 –477.
6. Brand Miller, J.C. et.al (2003): Physiological Validation of the concept of glycemic load in young lean adults. *The Journal of Nutrition* **133** (9): 2728 – 2732.
7. Brand Miller, J.C et.al (2003): Low Glycemic index diet in the management of Diabetes. *Diabetes Care* **26** (8): 2261 –2267.
8. Wolever, T.M.S and Mehling, C (2003): Long-term effect of varying the source or amount of dietary carbohydrate on postprandial plasma glucose, insulin, triacylglycerol, and free fatty acid concentrations in subjects with impaired blood glucose tolerance. *American Journal of Clinical Nutrition* **77**: 612 -621
9. Frost G et.al (1999): Glycemic index as a determinant of serum HDL-cholesterol concentration. *Lancet* **323**: 1045 –8.
10. Jarvi, A.E et.al (1999): Improved glycemic control and lipid profile and normalized fibrinolytic activity on a low glycemic index diets in type 2 diabetic patients. *Diabetes Care* **22**: 10 - 18
11. Riccardi, G and Rivellese, A.A (2000): Dietary treatment of the metabolic syndrome – the optimal diet. *British Journal of Nutrition* **83**: suppl. S143- S148.
12. Slabber, M et.al (1994): Effect of a low insulin response energy restricted diet on weight loss and plasma insulin concentrations in hyperinsulinemic obese females. *American Journal of Clinical Nutrition* **60**: 48 –53.
13. Ebbeling, C.B et.al (2003): A reduced glycemic load diet in the treatment of Adolescent Obesity. *Arch Pediatr Adolesc Med* **157**: 773- 779.
14. Pawlak, D.B; Ebbeling, C.B; Ludwig, D.S (2002): Should obese patients be counselled to follow a low glycemic index diet? Yes. *Obesity Reviews* **3**: 235 -243
15. Frost, G; Wilding, J; and Beecham, J (1994): Dietary advice based on the glycemic index improves dietary profile and metabolic control in type 2 diabetic patients. *Diabetic Medicine* **11**: 397 –401.
16. Vermeulen, A and Turnbull, W.H (2000): Feasibility of *The G.I. Guide* to increase knowledge about the glycemic index in practice. *Journal of Human Nutrition and Dietetics* **13**: 397 –405.

Session Title: Women: The Key to Food Security
Speakers: Susan L. Roberts, Denise O'Brien, **Dag Falck**

Speaker: Dag Falck

Subtitle: Women: The Key to Food Security. *Why Women Hold the Answers to Building Sustainable Agriculture.*

In today's culture in North America we have become estranged to the food we eat as a result of the move from a predominantly farming society, to one where most people earn their living in cities far from the farms. This has created a situation where we are disconnected from our food, it's production, and distribution. How has this changed agricultural policy and methods around the world?

We see a strong trend towards more and more, chemically aided production, large scale processing and distribution. Family farms and women's roles in agriculture have been eroded, and replaced with "more efficient operating systems".

Large scale production often favor methods that sacrifice product quality, environments and operator safety. For instance the health of farm workers and environments are sacrificed when applying pesticides in order to cheaply control pests, or product freshness is sacrificed in order to have an efficient distribution system that covers several continents.

Can large scale agriculture be sustainable?

What is the role of women in modern sustainable agriculture?

Can farmers be sustainable if they don't save seeds?

What food security issues threaten North America's food supply?

What can women in North America do for women in the rest of the farming world?

Is it possible to have a healthy sustainable agriculture without the common consumer knowing anything about food growing methods, who the growers are, where the food comes from etc.?

In this presentation we will explore some of the answers to these questions, and what roles women play in agriculture, and food security issues. Also insights will be shared into how our cultural knowledge and understanding the food we eat directly affects our agricultural policies and direction.

The focus will be on helping to show how each person can take practical simple steps, towards understanding the food issues, and how this in turn will promote a healthier and more sustainable agricultural policy for North America and the world, and at the same time build greater personal health.

Session Title: Women: The Key to Food Security
Speakers: Susan L. Roberts, Denise O'Brien, Dag Falck

Speaker: Denise O'Brien, Women, Food and Agriculture Network

Subtitle: Women: The Key to Food Security: Success Stories from Developing Countries and the United States.

I. Introduction

- a. Rural Women's Statement at World Food Summit 1996**
- b. Overview of what type of agriculture women engage in**
- c. How women are gathering strength in numbers**

II. Examples - Internationally and U.S. women in agriculture

a. Cuba – Women account for approximately 20 percent of the urban farming workforce and 30 percent of the technical support for such endeavours, although only 11 percent hold managerial-level or supervisory posts.

b. Africa - Women have unique knowledge about the value and use of genetic resources for food and agriculture. In sub-Saharan Africa, women cultivate as many as 120 different plants in the spaces alongside men's cash crops.

c. India - Women are primarily responsible for the production of secondary crops such as pulses and vegetables, which are often the only sources of nutrition available to families in lean seasons. There is a steady increase in the number of women-headed households, and women have become the major stakeholders in farming of self-owned or leased lands.

d. United States – Women entering agriculture and creating new opportunities for small home based businesses. The community supported agriculture movement in the United States is being led by women. This agriculture is on a smaller scale but the economic gain is considerable.

III. Conclusion

- a. Women are changing agriculture**
- b. Barriers still exist in access to land, capitol and information**
- c. Opportunities must be created for women in enter agriculture in all parts of the world.**

Session Title: Women: The Key to Food Security
Speakers: Susan L. Roberts, Denise O'Brien, Dag Falck

WOMEN: THE KEY TO FOOD SECURITY – THE ISSUES

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I. INTRODUCTION

A. Right to Food

1. Fundamental human right¹
2. Yet millions suffer hunger and malnutrition²

B. Women are key – have resilience and ingenuity for families/communities to survive

II. WORLD HUNGER

A. Food Security

1. Definition³
2. 840 million suffer from chronic hunger and malnutrition
3. > 150 million are < 5 years
4. 30,000 children die per day of related causes⁴

B. Food Production⁵

1. Virtually all countries can produce food needs
2. Current need vs. production
3. 54 countries do not meet need

C. Causes of World Hunger⁶

1. Historically – nature made - famines
2. Today – human made
 - a. war
 - b. poverty - economic policies, immoral conduct, corruption
 - c. socio-cultural factors - food taboos, lack nutrition education
 - d. political – commodity dumping

D. Women and Hunger⁷

1. Often first to suffer malnutrition in family
2. Examples: stunted growth, anemia, babies born malnourished

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¹ UN, Universal Declaration of Human Rights Res. 217 A (III) art. 25 § 1 (1948).

² FAO, State of Food Insecurity in the World 2002.

³ FAO, Rome Declaration on World Food Security and World Food Summit Plan of Action (1996).

⁴ UN Development Programme, Human Development Report 2002.

⁵ FAO, Mapping of the Food Supply Gap (1998).

⁶ Pontifical Council Cor Unum, World Hunger, A Challenge for All: Development in Solidarity (1996).

⁷ Stuart Gillespie, Empowering Women to Achieve Food Security-Health and Nutrition,

http://www.ifpri.org/2020/focus/focus06_08.htm (Aug 2001).

III. WOMEN'S ROLE IN FOOD SECURITY - ISSUES

- A. United Nations Rome World Food Summit, 1996, 2002⁸
 - 1. Commitment to reduce number undernourished 50% by 2015
 - 2. Plan of Action promotes legislation ensuring women equitable access to resources such as credit, land, and water
- B. Women in Agriculture⁹
 - 1. Produce 50% food grown in world; 75% in Africa
 - 2. Nearly 70% women work in agriculture in low income countries
 - 3. In developing countries, women do more ag work than men
 - 4. Lack of gender specific information hinders policies
- C. Obstacles to Women¹⁰
 - 1. Two major areas of hindering women in food security
 - a. lack of asset base
 - b. lack of laws and institutional framework to guarantee control over assets once acquired
 - 2. Examples:
 - a. need natural and physical capital assets
 - 1. tangible – i.e.: land, water, buildings, livestock
 - 2. produce food; convey status and power in community
 - 3. laws /customs - often do not allow women to own or inherit
 - 4. Africa and South and Southeast Asia
 - b. need human capital asset - education
 - 1. 2/3 illiterate in world are women; receive only 5% world extension education
 - 2. increases agricultural production, reduces poverty, lowers fertility, lowers child mortality, improves health of children
 - 3. women who are illiterate can not know legal rights
 - 4. Bangladesh
 - c. need social capital asset
 - 1. linking women to other women in social groups
 - 2. groups provide training, networking, and peer support
 - d. need financial capital asset
 - 1. safety net to reduce women's vulnerability to unexpected changes in weather, prices, economy, health, and relationships
 - 2. Examples: cash transfers (child maintenance grants); in-kind transfers (school feeding program); commodity subsidies; credit schemes (micro-credit)
 - 3. Legal Framework
 - a. for women to legitimately lay claim to and control assets
 - b. many constitutions/international conventions protect women
 - c. hinder women – ignorance of law, customs, religious practices
 - d. women must be included along with men in legal reform

⁸ FAO, *supra* note 3.

⁹ FAO, Women, Agriculture and Food Security Fact Sheet, 2001.

¹⁰ A. Qu isumbing & R. Meinzen-Dick, Empowering Women to Achieve Food Security Overview, 2001.

Session Title: Building Healthier Communities Using a Social Marketing Approach: The California Project LEAN Experience

Speakers: Paula D. Benedict



Building Healthier Communities Using a Social Marketing Approach: The California Project LEAN Experience

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The Community-Based Prevention Marketing (CBPM) model was adopted by California Project LEAN in 1999 as the framework for planning strategies, implementation, and evaluation of regional social marketing projects. This model, developed by researchers at the Prevention Research Center at the University of South Florida, describes a process for community health promotion programming, and is based on behavioral theories and commercial marketing techniques, with an emphasis on community involvement. CBPM is a community-directed social change process that applies marketing theories and techniques to the design, implementation and evaluation of health promotion and disease prevention programs.¹¹

- In the CBPM framework, “prevention” refers to promoting positive health behaviors and minimizing negative health behaviors. “Marketing” refers to the key distinguishing features of commercial marketing normally used to sell a product or service in the consumer marketplace.
- A primary goal of CBPM is to enhance the community’s ability to work together to achieve consensus. The community is engaged and empowered by problem definition, program planning and project implementation, and is an active participant in formative research and outcome evaluation.
- The CBPM approach is applicable to promoting health behaviors which are protective against major causes of death and disability. Addictive behaviors and risk

^{1,2} Bryant, C, Forthofer, M., McCormack Brown, K., Mc Dermott, R. (1999) Community-based-prevention marketing. *Social Marketing Quarterly*. 5 (3) 54-59.

behaviors with deep-seated psychological determinants requiring psychotherapy, or other individual-centered approaches are not considered.¹²

California Project LEAN pioneered using the CBPM approach to guide community nutrition programming. **For more information, access “Community-Based Social Marketing: The California Project LEAN Experience” at www.dhs.ca.gov/lean.**

Session Title: **Spotlight on Nutritional Monitoring and Surveillance of High Risk Groups**

Speakers: **Godfrey Xuereb, W.A. Van Staveren**

IDENTIFICATION AND MONITORING OF NUTRITIONAL RISK IN OLDER ADULTS.

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INTRODUCTION. With aging, many factors including physiological and social changes, the development of chronic diseases, the use of medicines and decreased mobility tend to put elderly people at risk for malnutrition. Changes in body composition and diminished physical activity reduce energy requirement and intake. Studies have shown that when energy intake falls below a level of about 6.3 MJ (1500 Kcal), it is hard to obtain a diet with sufficient supply of essential nutrients. Such insufficient diets bring elderly people with already reduced physiologic reserves into increased susceptibility to disability.

SCREENING and MONITORING QUESTIONNAIRES have been developed to timely obtain information about the nutritional status of older adults. The items in the questionnaire often include the main risk factors for malnutrition. Most questionnaires have been evaluated in elderly people with different background. Main research question of these evaluation studies was: do these screening lists identify malnutrition in elderly people correctly. Results varied from almost no agreement between reference diagnosis and identification with help of the list, to outcomes with more than 80% sensitivity and specificity for the same list but conducted in elderly people with a different background. Most likely shortcomings of the lists will be more balanced when they fit in a nutrition (and health) care plan. This holds for both independently living as well as institutionalised elderly people.

CONCLUSION and APPLICATION. Adequate nutrition care in older adults asks for timely identification of malnutrition. Screening and monitoring lists can be of great help when they fit in a total nutrition and health care program for older adults. A Dutch Guideline for fluid and food supply in nursing homes will be discussed as an example of such a program. The screening and monitoring part within this guideline will be highlighted.

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Session Title: **Spotlight on Nutritional Monitoring and Surveillance of High Risk Groups**

Speakers: **Godfrey Xuereb, W.A. Van Staveren**

Paper Title:
Monitoring of High Risk Groups – The role of the Dietitian

Name of Presenter:
Godfrey C. Xuereb
Public Health Nutritionist, Caribbean Food and Nutrition Institute, Kingston, Jamaica WI

According to a CDC definition a Public Health Surveillance System is *“The on-going, systematic collection, analysis and interpretation of health data essential to the planning, implementation and evaluation of public health practice, closely integrated with the timely dissemination of these data to those who need to know. The final link of the surveillance data chain is the application of these data to prevention and control. A surveillance system includes a functional capacity for data collection, analysis and dissemination linked to public health programs”*.

With this definition in mind the objectives of a risk factor surveillance system are to monitor trends and distribution of risk factors and to monitor the impact of interventions.

So why is the dietitian involved in these systems?

Generally, dietitians are in daily contact with people from the surrounding community and have a valuable opportunity of identifying high risk groups and intervening at an early and appropriate time. These groups could be persons who are living with HIV/AIDS and are prone to malnutrition, persons living with diabetes and are prone to complications of the condition, children with metabolic disorders etc.

The implications for an integral role of the dietitian in the prevention of disease have been the subject of various studies conducted worldwide. These studies have all shown that dietitians are excellently positioned with the clinical team to assist clients in making lifestyle modifications, that need to be made early and thus need to be identified as early as possible. The role of the dietitian in a Diabetes Prevention program has been identified at various levels:

1. In Ambulatory Care, dietitians can help identify persons or families at risk for developing diabetes. They can use the “toolbox approach” which involves identifying individual barriers to achieving intervention goals and selecting a tailored approach during weight control counseling to address such barriers.
2. At the inpatient level dietitians can integrate diabetes risk evaluation into nutrition assessment of patients and develop plans for follow-up of lifestyle issues for at-risk patients. They could also address prevention of diabetes with/for family members of patients with diabetes.

These two approaches although not typical of public health surveillance would fit into the definition by CDC if there was:

1. On-going systematic collection, analysis and interpretation of data
2. The timely dissemination of these data to those who need to know
3. Application of the data to prevention and control

Thus the information must be reasonably valid and reliable with a standardized method to allow comparisons within country and across country over time. Also there needs to be standardized quality control and quality-assurance mechanisms at the data collection and data entry levels.

This is where record keeping becomes an essential tool which needs to be monitored and evaluated periodically. Using standard formats of data entry is essential and international guidelines should be set by global bodies such as WHO and the International Confederation of Dietetic Associations. This would ensure that all clinical data is collected using a standardized method and reported uniformly throughout the dietetic community.

Another important role of the dietitian in surveillance of these high risk groups is to be able to produce effective evidence-based practice. By definition this is the conscientious, explicit and judicious use of current best evidence, based on a systematic review of all available evidence. This evidence, which is normally patient-reported, clinician observed and research-defined, is then used to carry out decisions about the care of individual patients. Thus also in this case the systematic collection, analysis and interpretation of data and the timely dissemination of these data to those who need to know is the basis of the practice. The dietitian has an important role in this phase of surveillance and an even more important role in the application of the data to the management of prevention and control of disease.

Clinical practice guidelines have also been used to evaluate quality of care and once again the accuracy of reporting is essential. Clinical effectiveness cannot be measured unless the appropriate parameters have been taken and recorded. Thus the need for an indicator-based information system with specific cut-offs for which there is international consensus. These systems will not only serve as a clinical report but can also be used for surveillance of high risk groups and auditing quality of care delivery.

Dietitians should be an integral member of the data collection and management team for any surveillance system that is being used to monitor high risk groups. This however can only be achieved effectively and efficiently if international standards are established for the methods of collecting and reporting and on the definitions of the indicators which are to be used in the surveillance systems.

Steps in the Community-Based Prevention Marketing Model¹³

Step 1: Mobilize the Community.

An infrastructure of a local lead agency and a group of willing, cooperative partners must be established in the community. This group forms a coalition and partnership to guide the development of the social marketing campaign through all steps in the CBSM process. In the case of Project LEAN regional projects, an agency staff person was designated as the Project Coordinator of this mobilized local coalition.

Step 2: Develop a Community Profile

Basic demographic data, such as mortality and morbidity data, dietary intake and behavioral surveys, and community statistics are compiled to provide a snapshot of the community's strengths and problems. In addition, an assessment of community capacity and a literature review pertaining to the health risk are included. Partners are trained to assist in developing the community profile.

Step 3: Select the Risk/Protective Behavior to Be Promoted

The community coalition reviews the community profile and identifies the key problems in the target community. Coalition member concerns with addressing specific issues are evaluated and discussed. Problems are prioritized and issues are selected in order to develop a campaign with a measurable behavioral objective and focus.

Step 4: Develop a Project-Specific Advisory Committee

A subcommittee of the coalition is formed to advise and direct the CBSM project. This group is trained by the Project Coordinator on social marketing theory and determines the campaign's behavioral objective and target audience. The advisory committee participates in the development of research design, marketing plans, and evaluation.

¹³ Bryant, C, Forthofer, M., McCormack Brown, K., Mc Dermott, R. (1999) Community-based-prevention marketing. *Social Marketing Quarterly*. 5 (3) 54-59.

Step 5: Conduct Formative Research with the Target Audience

Community members are trained to collect and analyze data and participate in gathering pertinent information that serves to drive the project design. Planning for sufficient time and resources is necessary at this step to gather the necessary data.

Step 6: Strategy Development

At this step, the formative research has been reviewed and a marketing plan is developed based on the constructs of the marketing framework. This plan includes a clear statement of the project's overall goals, a description of the segmented target audience and the specific behavior(s) that will be promoted. In addition, strategies planned to address critical factors associated with the target health behaviors are determined.

Step 7: Campaign Development

Before progressing to implementation, all materials and planned campaign tactics are pre-tested with the target audience. The community coalition helps mobilizes resources needed for program activities, and strives to strengthen the institutional foundation upon which the campaign must be sustained.

Step 8: Program Implementation

The local Project Coordinator works closely with members of the advisory committee to ensure that program components are coordinated and conducted in the proper sequence. Components may include professional training, materials distribution, public relations, legislative advocacy, and instituting systems and environmental changes.

Step 9: Tracking and Evaluation

Program evaluation is conducted by tracking process and measuring program outcomes. Feedback is provided to direct changes mid-course or for subsequent campaigns.

Session Title: **Food Biotechnology: How Should Dietetics Professionals Communicate with Consumers and Other Stakeholders?**

Speakers: **Milly Ryan-Harshman, Ellen Desjardins, Lynne Brown**

Presentation Title: Public Health Implications of Food Biotechnology
-- Educating Health Professionals

Speaker: Ellen Desjardins, MHSc, RD: Ontario Public Health Association, Canada

Presentation Overview

Food biotechnology has emerged as a public health issue in Canada, for three main reasons: (a) it affects the food of supply the entire population, (b) it has strong impact on agriculture and the environment and (c) it is a rapidly growing new technology with unpredictable consequences. Yet, public health dietitians and nutritionists face many unknowns, because food biotechnology research data are not freely available, GE foods/ ingredients are not labeled as such, the regulatory process is not transparent and tracking mechanisms are undeveloped. This impedes their ability to educate the public with confidence.

In order to have a voice in future policy directions that might improve this situation, public health professionals must understand the issues and be able to clearly state their position. The Ontario Public Health Association (OPHA) established a work group in 2000 for this purpose. In this group, public health nutritionists worked together with other disciplines, including environmental health and epidemiology, to prepare a position paper. As a follow-up, they created a series of eight fact sheets, corresponding to distinct areas of public health concern. These were evaluated within the field, and then modified to serve as an on-line, self-directed educational tool.

This presentation will focus mainly on the process of preparing professional educational materials about food biotechnology that aim to be objective and evidence-based. It is an on-going challenge to provide information in a way that helps clarify issues without over-simplifying, and that encourages the learner to critically appraise the wide variety of viewpoints.

At the federal level, OPHA was invited to send a representative (public health nutritionist) to take part in the development of a "Dialogue Tool", a project of the Canadian Biotechnology Advisory Committee (CBAC). This Dialogue Tool is the product of three years of work by a multi-stakeholder group including biotechnology developers, consumer associations, environmental activists, the food processing and retail sectors, farmers, the faith community and public health. The goal of the guided dialogue process is to enhance communication and mutual understanding of diverse opinions among a multi-stakeholder group. It does this by guiding participants through discussion in terms of health, environmental safety, social and ethical considerations.

Presentation Outline

1. The OPHA project: Educating public health professionals about GE food
 - (a) Brief history of strategic process
 - (b) The "8 public health issues" as an on-line educational tool

2. The CBAC project: A tool for dialogue between multiple stakeholders
 - (a) Brief history of strategic process
 - (b) The Dialogue Tool and pilot tests to date

Session Title: Food Biotechnology: How Should Dietetics Professionals Communicate with Consumers and Other Stakeholders?

Speakers: Milly Ryan-Harshman, Ellen Desjardins, Lynne Brown, Jennifer Wilkins

Food Biotechnology: How Should Dietetics Professionals Communicate with Consumers and Stakeholders?

Current State of the Technology

Plant biotechnology

Crops

Adoption rates

Animal biotechnology

Research examples

Approvals

Issues

Human

Allergenicity

Nutritional value

Labeling

Agricultural

Outcrossing

Pesticide reduction and insect resistance Biodiversity

Societal

Intellectual property rights

Ethics

Reasoning Behind the Controversy

Competing farm philosophies

Technological solutions

Organic farming

Integrated pest management

Competing food security philosophies

Contribution of agricultural science

The right to food

Alternative practices & sustainability

Lessons Learned from Modern Food Biotechnology: Principles and Perspectives

Process

Engaging the audience

Ensuring fairness

Language

Bias

“Really wrong” and “really right” words to use

Critical Thinking

Skills development

Providing opportunities
Where Do We Take It From Here?

Resources

Consumer

Professional

Education

Continuing education for dietetics professionals

Changing the university curriculum

Communication

Guiding the consumer to information

Responding to enquiries

Preparing presentations

Conclusion

“The pen is mightier than the sword.”

Session Title: **Food Biotechnology: How Should Dietetics Professionals Communicate with Consumers and Other Stakeholders?**
Speakers: **Milly Ryan-Harshman, Ellen Desjardins, Lynne Brown, Jennifer Wilkins**

Presentation Title:

Public Issues Education on Genetically Engineered Organisms – A Land Grant University Response

Speaker: Jennifer Wilkins, PhD, RD; Division of Nutritional Sciences; Cornell University

Presentation Overview

Many of us are familiar with the estimates suggesting that more than 60% of food products on US supermarket shelves contain at least a small quantity of some crop that has been genetically engineered (GE). But few consumers and the majority of nutrition practitioners are sure which foods are most likely to contain GE ingredients. As the prevalence of GE foods in the marketplace increases, consumers will likely want more information about the technology and its effects. And nutrition practitioners can expect to be called upon to respond to questions about foods containing or derived from genetically engineered organisms. Questions arise as to how best to communicate the current state of knowledge related to the health, environmental, and economic implications of adopting GE technologies

The Genetically Engineered Organisms Public Issues Education (GEO-PIE) Project strives to increase awareness among the public about which foods in the marketplace currently are likely to contain GE ingredients, to enhance consumers ability to think critically about the issues, and to assist educators and nutrition professionals in addressing questions about GE foods. The project acknowledges that genetic engineering technologies in the food and agriculture system raise complex issues and that people will likely value and understand these issues very differently; especially as new applications of the technology are made available.

Presentation Outline

1. Background and impetus for the GEO-PIE project
2. Development of educational materials
 - a. Issues and topics
 - b. Presentations
 - c. Feedback
3. Communicating about GE foods within the Land Grant context

Session Title: **Food Biotechnology: How Should Dietetics Professionals Communicate with Consumers and Other Stakeholders?**
Speakers: **Milly Ryan-Harshman, Ellen Desjardins, Lynne Brown, Jennifer Wilkins**

Speaker: J. Lynne Brown

Title: Do men and women want different information?

Outline

- Summary of literature suggesting gender affects perceptions of risk
- GE application investigated- GE salmon
- Reason for choice of focus groups as research method
- Description of focus groups
- Participant characteristics

Results ---

- Both sexes wanted information on
 - The genetic engineering process used in production,
 - Fish farming,
 - Ecological impacts
 - Details of government review
 - How growth hormone in fish is metabolized in humans
- Men more than women wanted
 - a) Reassurance that government regulators are doing their job
 - b) Details about the business decisions involved in GE fish production and marketing that would accompany introduction
 - c) Assurance of long-term safety from multiple groups rather than just the government.
- Women more than men wanted information on
 - a) Effect of GE on fish
 - b) Nutrient content, especially vs. wild
 - c) Impact on texture and taste
 - d) Long term safety as established by human studies
 - e) Safety for children, and other family members
- Recommendations for addressing these needs.