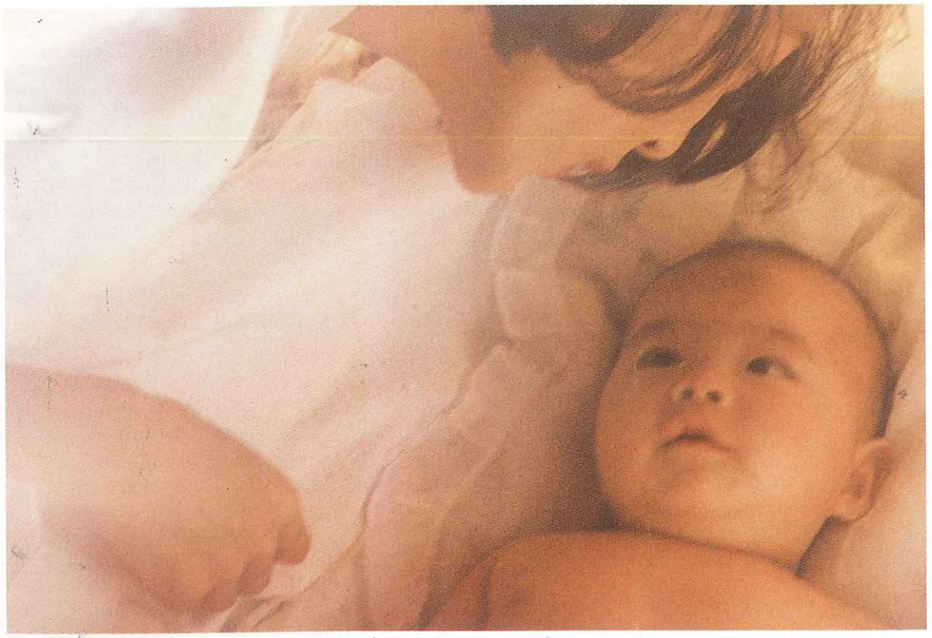

Mum, please carry on breast-feeding me

# DO SINGAPOREANS BREAST-FEED LONG ENOUGH?

Although any duration of breast-feeding is better than none, the mothers in Singapore who do breast-feed, tend to stop immediately after their period of confinement. This is too soon. Ideally a mother should breast-feed well past the period when first-stage infant formulas are acceptable. However all mothers must stop eventually, and when they do, it's reassuring to know that good nutrition doesn't have to end. Recommend NAN 2.

Nestlé


**IMPORTANT NOTICE:** The World Health Organisation (WHO*) has recommended that pregnant women and new mothers be informed of the benefits and superiority of breast-feeding – in particular the fact that it provides the best nutrition and protection from illness for babies. Mothers should be given guidance on the preparation for, and maintenance of, lactation, with special emphasis on the importance of a well-balanced diet both during pregnancy and after delivery. Unnecessary introduction of partial bottle-feeding or other foods and drinks should be discouraged since it will have a negative effect on breast-feeding. Similarly, mothers should be warned of the difficulty of reversing a decision not to breast-feed. Before advising a mother to use an infant formula, she should be advised of the social and financial implications of her decision: for example, if a baby is exclusively bottle-fed, more than one can (450g) per week will be needed, so the family circumstances and costs should be kept in mind. Mothers should be reminded that breast-milk is not only the best, but also the most economical food for babies. If a decision to use an infant formula is taken, it is important to give instruction on correct preparation methods, emphasizing that unboiled water, unboiled bottles or incorrect dilution can all lead to illness. ** See: International Code of Marketing of Breast Milk Substitutes, adopted by the World Health Assembly in Resolution WHA 34.22, May 1981.*

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SINGAPORE NUTRITION AND DIETETICS ASSOCIATION

*The Singapore Journal of*

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## *Nutrition & Dietetics : Current Trends & Future Directions*

- *Phytochemicals and Functional Foods*
- *Update on Diabetes Research Trends and Diet Guidelines*
- *Metabolism, Safety and Usefulness of Aspartame*

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*The Singapore Journal of*

# NUTRITION *and* DIETETICS

Vol. 5 No. 1 June 1995


## EDITORIAL

*In this issue, we deal with "functional foods", the new hot topic in the food industry. Functional foods promise to change the way we look at foods - not just as nutrient sources but ingredients with health enhancement and disease prevention potential. The recent position paper of the American Dietetic Association, reproduced in this issue in full, will be a brief introduction to the topic that will be addressed more thoroughly at the First International Conference on Functional Foods, to be held in Singapore in September this year.*

*In this issue, we also carry Dr. Edward Horton's paper which reviews the changes to the "diabetic diet" since its inception. The latest US diabetic diet guidelines do away with standard diabetic diets and stress the importance of individualised diet prescriptions based on blood profiles. Dr. Christian Tschanz's paper reassures many educators on the safety of the use of aspartame in a healthy diet for all including diabetics individuals.*

*Also included is a questionnaire for all our readers, especially the medical practitioners, who have been receiving this journal for over 9 years. We would appreciate your feedback to help our editorial team streamline the contents for our readers.*

**Anna Jacob**
*Editor*

## CONTENTS

# Position of The American Dietetic Association: Phytochemicals and Functional foods

In addition to the nutrients that are involved in normal metabolic activity, foods contain components that may provide additional health benefits. These food components (generally referred to as *phytochemicals*) are derived from naturally occurring ingredients and are actively being investigated for their health-promoting potential. Health benefits of these foods are best obtained through the consumption of a varied diet using our normal food supply. These phytochemicals and/or health-preserving elements are present in a number of frequently consumed foods, especially fruits, vegetables, grains, legumes, and seeds and in a number of less frequently consumed foods such as licorice, soy and green tea. In addition, *functional foods,* which are defined as any modified food or food ingredient that may provide a health benefit beyond the traditional nutrients it contains[1], are being developed and subjected to scientific evaluation. In recent years, the number of functional foods that have potential benefits for health has grown tremendously. Scientific evidence is accumulating to support the role of phytochemicals and functional foods in the prevention and treatment of disease. Phytochemicals and functional food components have been associated with the prevention and/or treatment of at least four of the leading causes of death in this country - cancer, diabetes, cardiovascular disease and hypertension - and with the prevention and/or treatment of other medical ailments including neural tube defects, osteoporosis, abnormal bowel function, and arthritis[2]. The National Cancer Institute estimates that one in three cancer deaths are diet related and that 8 of 10 cancers have a nutrition/diet component. These figures alone suggest that the potential impact of phytochemicals and functional foods on the health of Americans is worth examining.

With the current emphasis on cost-effective health care, the importance of dietary changes to optimise health continues to gain recognition and acceptance. As a result, the food industry is responding to consumer demands for a more healthful food supply by developing nutrient-rich food products, including products lower in fat and sodium, that are consistent with the US Dietary Guidelines for Americans[3]. In another effort to help the public make sound dietary choices, the Nutrition Labeling and Education Act (NLEA) was passed in 1990 and has resulted in more responsible labeling of all food items. Food labels provide a reliable source of applicable nutrition information for consumers. In addition to the Nutrition Facts panel, products may use the Food and Drug Administration's (FDA) pre-approved health claims, which are based on sound scientific evidence and agreement among scientists in the field of food and nutrition. All of these factors have contributed to increasing awareness of phytochemicals and functional foods and their potential beneficial role in the prevention and treatment of disease. There is also a need for further investigation of these substances for potential health benefits and possible health risks.

* *Reproduced in full from Journal of the American Dietetics Association, April 95.*

## Position Statement

It is the position of The American Dietetic Association (ADA) that specific substances in foods (eg. phytochemicals as naturally occurring components and functional food components) may have a beneficial role in health as part of a varied diet. The Association supports research regarding the health benefits and risks of these substances. Dietetics professionals will continue to work with the food industry and government to ensure that the public has accurate scientific information in this emerging field.

## Rationale

### Scientific research

Epidemiologic research has shown a positive association between dietary intake of food components found in fruits, vegetables, grains, fish oil and legumes and their effect on chronic disease[4-7]. Other nutrient-related correlations link dietary fat and fibre to prevention of colon cancer[8], folate to the prevention of neural tube defects[9], calcium to the prevention of osteoporosis[10], psyllium to the lowering of blood lipid levels[11], and antioxidant nutrients to disease prevention[12-14], to list just a few.

Scientists have begun to identify specific food components, called phytochemicals, that may expand the role for diet in the prevention and treatment of disease. Examples include indoles, isothiocyanates, and sulforaphane, which are found in vegetables such as broccoli and have been shown to trigger enzyme systems that block or suppress cellular DNA damage, reduce tumour size (in animal studies[15]), and decrease the effectiveness of estrogen-like hormones[16]. Allylic sulfides, which are found in onions and garlic, are another example. They enhance immune function, increase the production of enzymes that help to excrete carcinogens, decrease the proliferation of tumour cells, and reduce serum cholesterol levels[17]. Many other phytochemicals may offer benefits hitherto unknown. For instance, the isoflavonoids found in soy have been shown to reduce serum cholesterol levels through the production of weak estrogens via fecal formation in the human gut[18].

Scientific evidence indicates that there is a need for caution in the use of phytochemicals to prevent and treat disease. Although most clinical data support a positive role for phytochemicals and nutrients in the prevention of disease, animal research indicates that certain food components may be deleterious to our health. For example, some phenols (found in vegetables) or thiocyanate may promote cancer formation by promoting N-nitroso formation[19]. In addition, selenium, which is generally considered to be a cancer-preventing nutrient, has been shown to induce pancreatic cancer in a mouse model[20]. These studies are in the minority in terms of total numbers; however, their clinical implications must be considered in the design of future clinical trials and in recommendations for intake, supplementation, and/or potential future fortification of the food supply.

| Term | Definition/ characteristic elements |
|---|---|
| Chemopreventive agent | Nutritive or non-nutritive food component being scientifically investigated as a potential inhibitor of carcinogenesis for primary and secondary cancer prevention[15]. |
| Designer food | Processed foods that are supplemented with food ingredients naturally rich in disease-preventing substances[19]. This may involve genetic engineering of food. |
| Functional food | Any modified food or food ingredient that may provide a health benefit beyond the traditional nutrients it contains[1]. |
| Nutraceutical | Any substance that may be considered a food or part of a food and provides medical or health benefits, including the prevention and treatment of disease[1]. |
| Pharmafood | Food or nutrient that claims medical or health benefits, including the prevention and treatment of disease. |
| Phytochemical | "Substances found in edible fruits and vegetables that may be ingested by humans daily in gram quantities and that exhibit a potential for modulating human metabolism in a manner favourable for cancer prevention"(34, p76). |

***Definitions of functional foods and related terminology.***

### Defining Terms

Confusion exists about how to describe this newly evolving area of food and food technology because numerous interchangeable or related terms have been suggested or published in the United States, Europe, and Japan (Figure). These include terms such as pharmafoods, functional foods, phytochemicals, chemopreventive agents, and therapeutic foods. Common to all of these terms in the assumption that these foods or components found within them have a potential beneficial role in the prevention and treatment of disease. Other new terms, such as bioengineering, biotechnology, and designer foods, relate to the technology available to develop phytochemical-rich foods[1,21]. Phytochemicals are readily available in ordinary food today, but efforts to enhance their presence or concentration through bioengineering and the creation of designer foods are underway.

### Professional issues

Because of their extensive education and experience in nutrition, diet, health promotion, and disease prevention and treatment, dietitians are the most appropriate health care professionals to make recommendations to consumers regarding the inclusion of phytochemical-rich and functional foods in their daily diets. Dietetics professionals should be the primary resource for consumers, physicians, nurses, pharmacists, and other health professionals on issues related to the use of phytochemical-containing and functional foods to prevent and treat disease.

Most importantly, dietetics professionals have an opportunity, given their depth of nutrition knowledge, to work collaboratively with scientists and researchers, educators, the food industry and government to promote accurate and appropriate research, dissemination of information, product development, regulation, and consumer education in this area.

## Key Points

The benefits of phytochemicals and functional foods have been extensively publicised in the popular press, which has resulted in increased public awareness and interest in consumption of phytochemical-rich foods and functional foods as a method of enhancing health and well-being. Although scientific evidence of clinical benefits is limited, evidence is mounting to support the incorporation of foods rich in phytochemicals into the diets of most Americans. In the early 1980s, the National Cancer Institute Chemoprevention Programme of the Division of Cancer Prevention and Control was created to study the scientific merit of the thousands of food components being identified as chemopreventive. As a result, individual food components are being evaluated using a rigorous five-phase programme to determine their safety, efficacy and applicability for preventing and treating cancer.

### Diet vs supplement

In addition to the hundreds or even thousands of components already identified, additional phytochemicals remain to be found. Evolving research indicates that benefits will need to be achieved through consumption of a varied diet that includes a minimum of five servings daily of fruits and vegetables, consistent with the Food Guide Pyramid[22]. Well-designed clinical trials, several of which have been completed[23-25], indicate that the beneficial effects associated with a diet high in fruits and vegetables may not be demonstrated when individual nutrients, such as vitamins E and C or beta-carotene, are consumed in supplement form. For example, in 1994, Greenberg and colleagues[26] published the results of a 4-year, randomised, controlled clinical trial in which 864 patients were given supplemental vitamins E and C and beta-carotene to prevent colorectal adenoma[26]. They concluded that antioxidant supplements were not beneficial in reducing colorectal cancer risk and that "additional dietary factors" (such as phytochemicals) may play a more important role. Further research is needed to clarify whether a difference in clinical outcome exists as a result of consumption of

whole foods vs isolated nutrients such as phytochemicals before specific recommendations can be provided to the consumer.

Pharmaceutical companies will be motivated to isolate components in foods into pill or supplement form to market the individual components for their health benefit(s). In the United States, sales of foods in this area exceed $6 billion annually[27]. In 1988, Americans spent approximately $2 to $2.5 billion annually on vitamin/mineral supplements alone with the expectation that supplement consumption will ensure optimal health[27]. It is estimated that there has been a substantial increase in the sales of supplements in the past several years. As the evidence of the health benefits of functional foods and phytochemicals grows, Americans will be easy prey for supplementation abuse. The public must be convinced that the more appropriate choice would be to increase fruit and vegetable consumption (currently 11% or less of the population consumes no fruits or vegetables)[28] and to incorporate other foods (in addition to fruits and vegetables) containing beneficial health components as part of a varied diet based on the principles of the Food Guide Pyramid[22].

### Levels of intake: Pending recommendations

The optimal levels for phytochemical and functional food intake have yet to be determined. A large body of epidemiologic data supports the role of phytochemical-rich foods in disease prevention and has spurred scientific curiosity to the point that animal and human research trials have been initiated in this exciting new area. Numerous animal studies[15,29] offer some indication of the levels of intake necessary to achieve health benefits; however, these levels are difficult to extrapolate to human dietary intake requirements. A clinical trial by Chandra[30] to evaluate the relationships among micronutrient status, vitamin/mineral supplementation, and immune function in elderly subjects indicated that optimal intake is related to baseline serum levels of key nutrients. A multicontinent epidemiologic study by Gey et al[31] showed that cardiovascular disease risk appeared to be associated with low plasma concentration of antioxidants. Gey et al also identified optimal plasma levels associated with reduced risk. This study supports the notion that intake levels should be based on individual requirements necessary to achieve optimal plasma levels of micronutrients.

Continued in-vivo and in-vitro research must be completed before specific recommendations can be formulated. Health professionals making recommendations related to the optimal intake levels for phytochemical-rich and functional foods must recognise that requirements will likely be altered in the presence of active disease such as cancer. Therefore, dietary advice related to phytochemical and functional foods intake will need to be evaluated within the context of specific patient populations or individual variance.

### Health-promoting food product development

Current amounts of naturally occurring components contained in foods, in portions commonly consumed, may be inadequate to achieve optimal health benefits. Perhaps enhancement of foods through genetic engineering (ie, development of functional foods), as is already available with vitamin C-enriched oranges, high-phytochemical broccoflower, and fibre-enriched baked products, may be a reasonable approach to achieving optimal health benefits. One example that demonstrates the need for enhancing the phytochemical content of foods is apparent in the research related to beta-carotene. Current dietary intake levels of beta-carotene are estimated at 1.5 mg daily. The best estimate of appropriate intake level, based on intakes reflected in populations with the lowest rates of cancer, cardiovascular disease, and cataracts and the highest improvement in immune parameters, is approximately 6 mg/day. Intake levels necessary to achieve protective effects in "at-risk" populations, based on recent clinical trials, exceed 20 mg/day[24,32]. Thus, development of foods rich in beta carotene through genetic engineering or fortification of the food supply may be a viable alternative. The advantage of improved dietary intake and/or food fortification/modification over supplementation is that the consumer will continue to consume food to meet beta carotene requirements while at the same time consuming other naturally occurring health-promoting phytochemicals found in the genetically engineered or fortified food. Consumption of supplements will only provide selected components in a concentrated form not the diversity of phytochemicals that occur naturally in foods. Potentially, biotechnology, food fortification and plant breeding could notably enhance the amount and presence of these key components in functional foods.

## Regulation

Currently, functional foods are not regulated although they may be partially so under the NLEA[33]. Health claims on labels are currently authorised by the FDA on the basis of available scientific evidence and the presence of substantial scientific agreement that demonstrates a clear relationship between the food or food component and the specific health benefit. The food industry, which is primarily interested in the marketing potential of phytochemical-rich foods, may need some degree of marketing exclusively to ensure their ability to recoup the large financial investment required to perform the clinical research needed to meet any regulatory requirements. The current paucity of data from the large-scale clinical trials that are necessary to establish the efficacy of specific functional foods has prevented most functional foods from meeting labeling requirements.

A more flexible approach to regulatory requirements and propriety rights to research investments may be necessary to allow for the timely advancement of food technology and product development. Keeping in mind that accurate and reliable health claims have a positive effect on consumer eating behaviour and consumer knowledge of the diet-disease link, the need to regulate functional foods is critical and should be addressed by FDA, the food industry, and health professionals.

## Role and responsibilities of the dietetics professional

The dietetics professional, as the health professional with the most extensive educational training in nutrition, is the specialist who should make recommendations concerning appropriate dietary intake to optimise the potential benefits of phytochemical-rich or functional foods in overall health. Yet this information is not widely available in undergraduate curriculum or in standard nutrition textbooks.



Dietetics professionals/nutritionists have an unique opportunity to play a cutting-edge role in the evaluation of phytochemical and functional food research and to translate the research findings into practical information for the consumer as this field evolves. Potential roles include the following:

- Advising the consumer on the appropriate intake of phytochemicals and functional foods within the context of a healthful diet.
- Educating ADA members, other health care professionals, the public, and legislators regarding the tremendous potential this area of research/practice provides in positioning dietetics professionals for a future in which health care clearly supports disease prevention.
- Participating in innovative and appropriate research in the field.
- Providing expertise to the food industry related to designing future functional foods.
- Working collaboratively with government to develop regulatory standards for functional foods.

ADA members should make informed decisions based on currently available, scientifically based research findings. Now and in the future, dietetics professionals will be increasingly called on to develop preventive meal plans, prescribe changes in food intake, enhance phytochemical and functional food intake, and evaluate the appropriateness of functional foods and dietary supplements to meet preventive (and therapeutic) intake levels for healthy persons and those diagnosed with clinical manifestations of disease. Responses to these inquiries must be based on scientific facts, sound knowledge of the issue, and responsible recommendations.

## Summary

Never before has the focus on the health benefits of commonly available foods been so strong. The philosophy that food can be health promoting beyond its nutritional value is gaining acceptance within the public arena and among the scientific community as mounting research links diet/food components to disease prevention and treatment. Dietitians are uniquely qualified and positioned to translate the available sound scientific evidence into practical dietary applications for the consumer and to provide the food industry and the government with valuable insight and expertise for future research, product development, and regulation of phytochemicals and functional foods. Increasing the availability of healthful foods, including functional foods, in the American diet is critical to ensuring a healthier population. As the nutrition experts, dietetics professionals must be the leaders in this new, exciting and meaningful field as it evolves.

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* *ADA Position adopted by the House of Delegates on October 16, 1994. This position is in effect until December 1998. The American Dietetic Association authorises republication of the position paper, in its entirety, provided full and proper credit is given. Requests to use portions of the position must be directed to ADA Headquarters at 800/877-1600, ext 4896.*

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# An Interview with Mrs. Lynn Alexander

**by Kath Walsh**

*In the last issue, the SNDA was very fortunate to interview Ms. Anita Owen, MA, RD (USA), a past president of the American Dietetic Association, who discussed the changing face of dietetics and nutrition over the past thirty years in the United States of America. In this issue, our president and a founder member of the Association, Mrs. Lynn Alexander, BSc, RD (Singapore) shared with Kath Walsh, a member of the SNDA Editorial Committee, her thoughts on past achievements and insights into the new challenges the SNDA faces in the years to come.*

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***SNDA :*** **With the Association's many accomplishments over the past 11 years, which ones stand out in your mind as particularly instrumental in bringing the Association to the professional status we enjoy today?**

***Alexander :*** The establishment of our professional journal "The Singapore Dietitian", now called "The Singapore Journal of Nutrition and Dietetics" was a major milestone which we achieved early on after our inception. The journal serves to give our profession good visibility amongst our fellow health-professionals, and with the high standard of production which we have maintained over the years, our profession is lent a high degree of credibility. Our journal is not only admired locally but regionally, that's why it was selected as the official journal of communication for the Asian Federation of Dietetic Associations.

The staging of our 5th year anniversary symposium - a one day event with 16 speakers from Singapore and overseas, stands out in my memory as a major achievement. It was a huge undertaking for a small body like ours, but we pulled it off, and at the same time gave our Association very good publicity.

Gaining admission to Singapore Professional Centre has to be the third milestone which I think has helped firmly establish our profession in Singapore.

***SNDA*** **The Association recently celebrated its 10th anniversary, what major changes have you witnessed since its inception in 1984?**

***Alexander :*** Within the Association, we have had a few constitutional changes. The first was when we launched the Continuing Education scheme. With this scheme we took responsibility to help encourage members to continually upgrade their professional skills and knowledge. The objective of continuing education is of course to ensure the continued high standard of practice from our profession.

A second major change was when we admitted nutritionists as full members. This move has greatly strengthened us as a professional group, concentrating our resources and help us increase our membership.

---

*Lynn Alexander is a Chief Dietitian at Kandang Kerbau Hospital. She is President of SNDA and is active on all its committees. Within the community, she is a well-known speaker and an author.*

*Kath Walsh is currently a principal lecutrer at the Language and Communication Skills Centre at Ngee Ann Polytechnic and a qualified Dietitian. She is an active member at the SNDA.*

Nutritionists have become involved in the Association's activities at main and subcommittee level. However, we have yet to have a nutritionist as President!

***SNDA :*** **What developments can you foresee for the Association, especially during your term of office?**

***Alexander :*** Over the next few years we will continue to build close ties with local professional bodies. I am pleased that we have recently begun to be involved with two key associations that previously we did not have any formal links with. We have been invited to be represented on the Diabetic Society of Singapore's "Professional, Scientific and Research Subcommittee". We have also recently worked with Singapore Medical Association to take part in their public forum in April at the Health Exhibition.

I would like to see the development of sub-speciality interest groups within the Association, such as a renal group or a diabetes group. This has actually begun in a small way with the recent formation of our sports nutrition working group.

Another development which I feel is important to consider, is to form a "watchdog committee" to respond quickly to matters arising in the media or issues of consumerism where we as the nutrition and dietetics professionals should take our stand and help educate the public correctly. In the past we have missed many opportunities to voice our expert opinion on nutrition-related issues, because we have been too slow to respond.

***SNDA :*** **With the present emphasis on regionalisation, is the SNDA considering forging links with other health professionals in Asia?**

***Alexander :*** Through sending delegates to regional and international conferences over the past years, we have already established good links with our colleagues in the region. These links will be maintained through our membership of Federation of Asian Nutrition Societies, Asian Federation of Dietetic Associations and International Congress of Dietitians.

***SNDA :*** **As many parts of Asia become more affluent and urbanised, what health problems do you anticipate with regard to nutrition?**

***Alexander :*** The problems of obesity, diabetes, heart

disease will become more rampant as affluence increases. Dietetics and nutrition professionals have a huge role to play in education for the prevention and management of these diseases.

***SNDA :*** **Do you envisage different employment opportunities for dietitians and nutritionists in the next five years?**

***Alexander :*** The employment field for our profession has widened considerably in the last ten years. I think we will continue to see more opportunities opening up for dietitians and nutritionists, besides the traditional roles of clinical work in hospital, and nutrition education in the community. Industry is increasingly turning to our profession for expert advice and consultation, and within the traditional hospital setting, as more dietitians are employed, we will expect to see the development of speciality dietetics positions, and more dietitians choosing to work in food service administration.

Many hospitals have now begun charging for dietetics services, a very positive move, as it will have the effect of improving the quality of service, and making the service more valued.

***SNDA :*** **What type of training do you see as necessary for members of the profession to cope with the various educational and technological changes of this decade?**

***Alexander :*** Those of us who trained in the 70s and 80s definitely need to work very hard to keep abreast of new developments in the field! Refresher training may not be locally available, but we must set aside time regularly to read journals, new texts and attend whatever workshops and seminars that come our way. This is where belonging to the professional body helps so much in keeping abreast of the latest trends and developments. And with the information technology revolution, that has swept through the late 80s and 90s, we risk getting left behind if we do not make every effort to avail ourselves of the new hi-tech IT gadgets at our disposable.

***SNDA :*** **What advice could you give to the members of the Association on promoting the profession and retaining its active role in Singapore?**

***Alexander :*** The Association can only be active as long as its individual members are active. My advice to members on promoting our profession is to be professional at all times. Seize opportunities that come your way - take up new challenges and strive for high visibility within your individual work setting, be it in hospital, educational institution or industry. Members who are involved in the Association actively derive a tremendous amount of professional satisfaction from their involvement. I would urge those of you who can, to come forward and take part in more of our activities - volunteer for committees; help out when manpower is needed for community events; and read and give feedback on your professional journal. If the SNDA is to remain active, we depend on the commitment and interest of the members as a whole, not just a few individuals.

# Interview with Prof. Chan Soh Ha

*Functional foods promise to revolutionize the way we look at nutrition in the future. This field is new and rather ambiguous and if the research promises materialize, nutritionists and dietitians will need to change and/or adopt new messages while educating patients and the public. SNDA felt that to stay on the cutting edge, our members need to stay abreast of the new information in the field. SNDA interviewed Prof Chan Soh Ha, who has been one of the active members instrumental in putting together the First International Conference on East-West Perspectives on Functional Foods.*

*Professor Chan Soh Ha is Director of the W.H.O. Immunology Centre, collaborating in Research and Training at the Faculty of Medicine, National University of Singapore. He is also the Co-Chairperson of the Organizing Committee and Vice-Chairperson of the Scientific Committees of the First International Conference on East-West Perspectives on Functional Foods to be held in Singapore from 26 - 29 September, 1995.*

**q. What is functional food?**

**a.** The term "functional food" can be vague and have a slightly different meaning to different people. To me, it is food that has an effect (usually good) on definable body functions. This is over and above the normal nutritional value of that food.

**q. What specific components in functional foods are responsible for the proposed health benefits?**

**a.** Some components have been identified eg. omega-3 and polyunsaturated oils in heart diseases, but the active components of most so-called functional foods (especially in the East) have not been identified.

**q. How do functional foods differ from fortified foods?**

**a.** Fortified foods are foods supplemented with specific components, eg. added calcium in fruit juices and vitamins in bread. Functional foods are natural products or made from natural products.

**q. Is consuming functional foods more preferable to taking dietary supplements?**

**a.** Definitely. Functional foods are natural and not subjected to chemical processing.

**q. How will functional food claims be regulated in the future?**

**a.** The guidelines for functional food claims are still being formulated. This conference will help in focusing our thoughts on this subject.



# Update on Diabetes Research Trends and Latest U.S. Diet Guidelines

Edward S. Horton, M.D.

Diabetes is a variety of different diseases, all of which are characterized by blood glucose concentration. If a random sample of blood indicates that glucose concentration is 200 mg/dl or greater and the patient has classic signs or symptoms, such as increased thirst, increased urination, fatigue and blurred vision, a diagnosis of diabetes can be made.

If a patient's fasting blood glucose concentration is 140 mg/dl or greater on at least two occasions, or if the fasting blood sugar concentration is less than 140 mg/dl but there is sustained elevation of blood glucose (over 200 mg/dl) during at least two glucose intolerance tests, these also serve to diagnose diabetes.[1]

Diabetes can be divided into two basic forms: Type I or insulin dependent diabetes (IDDM) and Type II or non-insulin dependent diabetes (NIDDM). Other less common forms include gestational diabetes which refers to high blood glucose concentrations during pregnancy, followed by a return to normal glucose concentration after delivery. However, women who have gestational diabetes very frequently develop frank NIDDM at a later time.[2-4] Gestational diabetes needs to be treated during the pregnancy because it is associated with increased mortality and morbidity of the pregnancy. But even after the pregnancy is over, these women are at a very high risk for developing diabetes later. So, efforts need to be made to prevent or delay the onset of diabetes in this population.

There are a few other types of diabetes, such as diabetes that occurs with surgical removal of the pancreas or with pancreatitis or some other endocrine conditions associated with diabetes. But those are relatively uncommon compared to IDDM and NIDDM.

Finally, impaired glucose tolerance is a condition between normal and diabetes. Impaired glucose tolerance exists when fasting blood glucose concentration is below 140 mg/dl but blood glucose rises into an intermediate range, between 140 and 199 mg/dl, two hours after an oral glucose challenge.[5] Just like people with gestational diabetes, people with impaired glucose tolerance very frequently go on to develop diabetes.[6-8] It is important to screen people who are at risk for diabetes, e.g. those with a positive family history or obesity, to determine if they have impaired glucose tolerance. If it is found, it is important to reduce weight, increase physical activity, and follow a proper diet, to try to prevent or delay the progression to full diabetes.

Type I diabetes, which used to be called juvenile onset or what is now called insulin dependent diabetes (IDDM), generally occurs in younger people. They have an absolute deficiency of insulin because of destruction of the beta cells of the pancreas; over time they have lost the ability to secrete insulin. Therefore, they are dependent on insulin administration for treatment. Without insulin they are prone to developing ketoacidosis. When they develop the disease and are under-treated, they lose weight. Even though IDDM characteristically occurs in children and young adults, it can occur at any age. We are now recognizing that even in older age groups this type of diabetes can develop.

Insulin dependent diabetes is an auto-immune disease. We now recognize that there is a certain genetic predisposition to developing it. There is an auto immune process that is triggered in the body, so that there is progressive destruction of the beta cells of the pancreas, resulting in insulin deficiency. Currently about 10% of all people with diabetes have IDDM. Ninety percent are in the NIDDM category.

People with NIDDM are generally older than 30 years. Frequently they have a positive family history of diabetes, are obese or have a history of obesity. Even though they may require insulin for treatment, they are not totally dependent on insulin. If their insulin is withdrawn, they do not develop ketoacidosis and diabetic coma.

The factors in the development of NIDDM are multiple. There is a genetic predisposition to the disease. There are some rare forms of NIDDM that are associated with a single gene mutation, but the usual form is clearly a polymorphic genetic abnormality.

To develop NIDDM, the following factors play crucial roles. First, the right genetic background, then other factors, including older age, the presence of obesity, and physical inactivity lead to development of insulin resistance. Insulin resistance, characterised by a reduced ability for insulin to exert its normal action on target tissues, i.e., muscle, adipose, and liver, then can lead to impaired glucose tolerance. As the syndrome develops, the elevation in blood glucose makes the insulin resistance worse. It also results in glucose toxicity of the beta cells, so there is a defect in insulin secretion. So there is both a deficiency of insulin secretion and a deficiency of insulin action. This vicious cycle then leads to the progression of NIDDM.[9]

This understanding of how NIDDM develops tells us how to approach preventing or treating it. While we cannot do anything about age and genetic background, we can do something about obesity and physical inactivity. And there are therapies that can change beta cell function and can lower the blood glucose concentration such that the progression in the development of NIDDM is interrupted.

Non-insulin dependent diabetes is also associated with several other comorbidities.[10] There are a number of terms that describe this constellation of abnormalities associated with NIDDM. The common conditions we see accompanying diabetes are dyslipidaemias, particularly

*Dr. Edward Horton is Professor of Medicine at Harvard Medical School and Medical Director of the Joslin Diabetes Centre in the US. Dr. Horton presented this paper at a Scientific Symposium on Diet and Diabetes: Current Issues and Future Directions, co-organised by SNDA and Diabetic Society of Singapore and sponsored by The NutraSweet Company..*

elevations of LDL and VLDL cholesterols, and low HDL cholesterol. We also see hypertension and premature atherosclerosis. This complex of conditions is called "Syndrome X" or the "insulin resistance hyperinsulinemia syndrome" because this is central to the pathogenesis of all the accompanying conditions.[11] It has been called the "deadly quartet" because the combination of diabetes, hypertension, and hyperlipidemia leading to premature atherosclerosis with cardiac disease, stroke and peripheral vascular disease, is what actually kills most people with diabetes.

People with NIDDM can get all the same long-term complications that people with IDDM do. In addition to the accelerated macro-vascular disease, they get the microangiopathies which include damage to the small blood vessels in the eye, leading to blindness; involvement of the nervous system and various neuropathies; the development of renal failure; and, also very commonly, problems with the feet and lower extremities which, while they are not fatal, certainly cause a lot of morbidity. Thus, the treatment of NIDDM is aimed at preventing all of these long-term complications.

Data from the second National Health and Nutrition Examination Survey show that NIDDM increases significantly with age, and is about one and a half to two times more prevalent among blacks than among whites.[6] Mexican-Americans have two to three times the prevalence of NIDDM in the U.S. compared to Caucasians.[12,13] Pima Indians in Arizona have the highest known prevalence of diabetes of any population in the world, with about 60% of adults over the age of 35 having diabetes. Other native American populations have less than that, but diabetes is still very high in this population.[14] It is now quite clear that other population groups around the world are at increased risk for developing diabetes over time.

Physical activity has been found to be a factor in the development of obesity and diabetes. A number of cross-sectional population studies have demonstrated that NIDDM and impaired glucose tolerance are more prevalent among those who are physically inactive vs. those who are physically active.[15] There are now at least four good prospective studies demonstrating that regular physical activity is protective for developing diabetes. For example, in a study of women college alumni who were formerly athletes, it was found that there was less development of diabetes in those who were former athletes and who maintained some physical activity during adulthood.[16]

In another study, nearly six thousand male alumni of the University of Pennsylvania were followed prospectively over a fifteen year period.[17] A dose-response relationship was observed, with those individuals who had the highest levels of both recreational and occupational exercise in their day to day lives having a very significantly lower incidence of developing diabetes compared to the more sedentary individuals.

Two of the largest epidemiological studies on the benefits of exercise recently were published. The Nurses Health Study of 87,000 registered nurses aged 34 - 59,[18] and the Male Physicians Study, which prospectively followed over 20,000 physicians aged 40 - 54.[19] In both of these studies, habitual physical activity clearly has been shown to be protective against developing NIDDM. There is no question that exercise is an important part of NIDDM prevention.

## Goals of management of diabetes

The goals of treating people with NIDDM are to achieve normal fasting glucose concentrations, normal post-prandial glucose, and normal glycosylated hemoglobin concentration. We use the glycosylated hemoglobin concentration as an index of the average blood glucose over the previous two to three month period. Glucose binds, at first reversibly but then finally irreversibly to hemoglobin, so that it can be measured in red blood cells. The higher the blood glucose concentration, the more glycosylated hemoglobin accumulates in the blood. So it is a good long-term measure of blood glucose concentrations. This has been used in a number of studies as an index of overall control, and we can monitor it on a regular basis.

We also treat the dyslipidemias, particularly the high serum cholesterol and high triglycerides that so commonly accompany diabetes. They are very clearly risk factors for the development of macrovascular disease. Also important is achieving normal blood pressure because hypertension, which accompanies NIDDM, has been shown to accelerate the development of both small and large vessel disease. Probably the most important goal is smoking cessation. Smoking is a very serious risk factor and is really disastrous for people with diabetes who have other risk factors for vascular disease.

Achieving desirable body weight is very important. There are now a number of studies that show that even a 10 to 20 pound weight loss in someone who is overweight and has NIDDM will dramatically lower blood glucose concentration, improve insulin sensitivity, and decrease the need for hypoglycemic agents. Elevated blood pressure can be lowered as well. If an obese individual who has hyperinsulinemia and elevated blood glucose loses weight, insulin and glucose concentrations can often be completely normalised. This shows how potent weight reduction is in improving metabolic control.

The modalities we use are diet, either caloric restriction for weight reduction or proper modulation of the diet to treat high glucose and high cholesterol and triglyceride concentrations. Physical exercise, as an adjunct to weight reduction, to improve insulin sensitivity and to lower blood pressure is also important. There are various oral hypoglycemic agents or other agents that may delay or prevent long-term complications, and, of course, insulin is used for daily glucose regulation.

## Nutritional therapy for diabetes

The goals of medical nutrition therapy are the same as overall goals, namely to achieve normalisation of blood glucose, normalisation of lipid profiles, and to provide appropriate calories for weight reduction; in children, normal growth and development; and, during pregnancy, normal pregnancy and lactation. A final goal is to improve health in general through optimal nutrition.

The American Diabetes Association has reviewed the nutritional guidelines for diabetes management several times over the years. It is interesting to take a historical perspective of our thinking on the dietary management of diabetes, even going back to before insulin was discovered. During this period, children who developed diabetes were treated with starvation diets. They were actually kept alive for periods of time by severely restricting total calories, no carbohydrates whatsoever, and very small amounts of protein. Children in the pre-insulin era were very emaciated looking.

When insulin was discovered in 1921, it was considered to be a miracle drug. Children with diabetes suddenly began to put weight back on and regain strength. But in those days, there was still the idea that carbohydrates were prohibited in the treatment. They were given diets that were 70% fat. It is very interesting that in the early days of insulin when they thought they had the cure, people were afraid to allow carbohydrates.

Then in the 1920s, '30s and '40s people began to move much more toward the use of prescribed "diabetic diets" for people with diabetes. When I was a medical student in the 1950s, we were taught the ADA diet: 40% of calories from carbohydrate, 40% from fat, and 20% from protein. It had to be divided very rigidly throughout the day - two-sevenths at breakfast, two-sevenths at lunch, two-sevenths at dinner, and one-seventh as a bed time snack. People were put on a rigid diet where they had to weigh all food and calculate their nutrients.

As the years went on, people began to liberalise this system a bit. In the early '70s, people began to see premature atherosclerosis and macro-vascular disease in people with diabetes. Dr. Edwin Bierman at the University of Washington in Seattle believed we were harming diabetics by allowing them too much fat, and suggested new recommendations to restrict fat intake and liberalise carbohydrate in the diet. In 1971 the ADA took the somewhat radical position of increasing carbohydrates to 45% in the diabetic diet.

Then in 1986 the American Diabetes Association joined with the American Cancer Society and the American Heart Association and said that all people, including people with diabetes, should restrict fat to 30% of calories, no more than 10% from saturated fats, 10% from monounsaturated, and 10% from polyunsaturated fats. ADA also recommended at this time to allow carbohydrates to increase to 55 - 60% of calories.[20] These changes to the recommendations, however, resulted in a paradox, such that while they worked for people with high LDL-cholesterol, the higher carbohydrate content was shown to cause some worsening of blood glucose control and increase triglycerides and VLDL-cholesterol in others.[21] And so a debate started. Is it better to restrict fat and lower serum cholesterol or better to restrict carbohydrate a bit more and get better glycemic control and lower triglycerides?

This debate continued from 1986 to the present time when an ADA committee convened to reconsider the nutritional guidelines.[22] After careful consideration, the committee concluded that we should recommend individualised diets for people with diabetes. First, we have to determine what problem we are treating, what the goals of nutrition therapy should be, and what the proper balance between carbohydrate and fat should be. So there no longer is a standard "ADA diet." Now we recommend individualised nutritional assessment and dietary prescription depending on the desired outcome.

The new ADA guidelines did not make many changes in the sodium, alcohol or micronutrient recommendations, so I will focus on protein, fat, and carbohydrates, including sucrose and other nutritive sweeteners, and high intensity sweeteners such as aspartame.

There has been a lot of interest in low protein diets for people with diabetes to prevent or delay the progression of renal disease. While there is some evidence that a very low protein diet may have some benefit, it is not strong enough to recommend that everybody with diabetes go on a low protein diet. So we concluded that protein should be between 10 and 20% of calories for the average diabetic. However, if renal failure is present, protein should be restricted to the adult RDA of 0.8 g/kg/day. There is quite a bit of evidence that limiting protein to 0.6 g/kg/day is actually deleterious because it causes negative nitrogen balance and loss of muscle mass.

We reviewed what literature was available on whether it makes any difference whether protein is obtained from animal versus plant sources. Some have suggested a vegetarian diet for people with diabetes. While there is some evidence that there may be some benefit here, we felt that this is an area that needs a lot more research before we can reach any conclusions about it.

With regard to dietary fat, the committee agreed that saturated fats should provide less than 10% of calories. But we changed from the previous guidelines in concluding that the percentage of calories from total fat can vary to allow for individualisation of the diet. In other words, a diet having more than 30% of calories from fat may be indicated for people with some forms of diabetes. Having reviewed all the literature about monounsaturated vs. polyunsaturated fats, our general recommendation was that if saturated fats should be less than 10% of calories, the rest of the fat should be predominately mono-unsaturated fats as they seem to be the beneficial ones. The committee also agreed that cholesterol intake still should be less than 300 mg/day.

The total amount of fat allowed is based on the therapeutic goals, determined during the nutritional assessment, the identification of the primary problem and the desired outcome. If obesity is a problem, then weight reduction is a primary goal, and reductions in total fat calories as well as total energy intake are very important. If the problem is increased LDL-cholesterol, we agreed that the National Cholesterol Education Program Step II Diet, i.e., less than 7% of calories from saturated fat, less than 30% of total calories from fat and less than 200 mg/day cholesterol, is very appropriate.

If the problem is elevated triglycerides and VLDL, then the committee concluded that one could allow the fat calories to go up and the carbohydrates need to be restricted a bit more, but still always keeping saturated fat at less than 10%. Here is where this kind of individual discretion in fat vs. carbohydrate comes into the new recommendations.

With regard to carbohydrate, we agreed that the percentage of calories can vary, individualised based on eating habits and the treatment goals regarding blood glucose and lipid profiles.

A noteworthy change in the ADA guidelines concerns sucrose. After reviewing all of the scientific studies on sucrose in the diabetic diet, the committee could not find any evidence that justified the old restriction of sucrose in the diet of diabetics. For example, Dr. John Bantle at the University of Minnesota conducted a study on a group of patients with NIDDM where sucrose was substituted isocalorically for complex carbohydrates.[23] In one treatment sucrose provided 19% of calories, and the other, less than 3%. The study lasted 28 days, and blood glucose profiles were measured throughout the day. Bantle found absolutely no difference between blood glucose concentrations when sucrose was substituted isocalorically for complex carbohydrates. In addition, there are at least twelve other studies done over the last

10 years using the glycemic index that clearly show that while individual carbohydrates sources do have various effects on blood glucose in the short term, in long term studies there is really no evidence that suggests that sucrose, within a fairly normal range of intake in the typical diet, has an adverse effect on glycemic control when substituted isocalorically for complex carbohydrates.

While the ADA has changed its position about sucrose in the diet of diabetics, it is important to be clear about what this change actually means. The ADA now states that sucrose can be *isocalorically* substituted for complex carbohydrates in the diet, but sucrose and sucrose-containing foods still should be used within the context of a healthful diet. If a person with diabetes does not cut back on his other carbohydrates and just increases intake of sucrose, he is not doing the right thing. This new recommendation does not license people to consume more sucrose and calories. In fact, one could say sucrose restriction in the previous guidelines was used as a surrogate for calorie restriction. The new guidelines still say calorie restriction is very important to achieve weight reduction.

High intensity sweeteners, such as aspartame, continue to provide an important advantage to diabetics because they help reduce total caloric intake. While diabetics may not need to be concerned about sucrose *per se,* they still need to be concerned about the calories that are provided by sugars. Since the majority of people with NIDDM are obese, caloric restriction is central to management of their condition. Use of foods sweetened with aspartame can help these people reduce their intake by a few hundred calories per day, and at the same time, save their carbohydrate intake for more nutritious sources.

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# NutraSweet®: An Unique High-Intensity Sweetener

## An Overview of Metabolism, Safety and Usefulness

**Christian Tschanz, M.D., Harriett H., Butchko, M.D., Wayne Stargel, Pharm. D., and Frank Kotsonis, Ph.D.**
Preclinical and Clinical Research,
The NutraSweet Company

*NutraSweet® brand sweetener (L-aspartyl-L-phenylalanine methyl ester), known generically as aspartame, provides the clean, sweet taste of sugar to products but without the calories. NutraSweet is unique among high-intensity sweeteners because, immediately upon ingestion, it is completely metabolised by enzymes in the gastrointestinal tract to three naturally-occurring dietary components which are as follows: aspartic acid and phenylalanine (constituents of normal protein), and the methyl ester forms a small amount of methanol (no different from the methanol formed from the abundant methyl esters in fruits and vegetables). NutraSweet provides very small amounts of these components when compared to what is present in the everyday diet (somewhere in the range of 2-3% for heavy users).*

*Prior to its approval by regulatory agencies around the world, the safety of NutraSweet was demonstrated by extensive metabolism, pharmacology and toxicology studies in animals. In addition, studies were done in healthy humans, including both adults and children, as well as in special subpopulations, including obese individuals, diabetics, lactating females and individuals who have an impaired ability to metabolise amino acids, such as individuals heterozygous for the genetic disease, phenylketonuria and individuals with liver disease. The results of these studies demonstrated that NutraSweet is a remarkably safe sweetener. In addition, NutraSweet provides the sweetness of sugar, but, unlike sugar, it does not raise blood glucose concentrations. Therefore, it may be a useful part of a diabetic meal plan. Due to the fact that it is so intensely sweet (1 g replaces about 200 g of sugar but provides only 4 calories versus 800 for sugar), it has been shown to be useful in facilitating body weight control.*

*Today, we are living in a world with much more intense trade and international exchange, which results in greater cross-cultural exchanges, including new dietary patterns. In societies such as Singapore, the affluent lifestyle and new dietary choices from the West have some drawbacks, such as overeating, which may lead to an increased incidence of certain diseases. In light of these potential risks, raising the preventive aspects of health issues related to nutrition and observing some dietary adaptations will offer opportunities for an even better life.*

### Introduction

Mechanised and highly efficient food production and distribution systems have brought consumers in countries such as the U.S., Western Europe and Singapore a wide variety of food choices, which also has a potential disadvantage - overeating. In addition, increased affluence and urbanisation often results in a more sedentary lifestyle. These factors together have contributed to the development of a greater prevalence of obesity, which, in certain predisposed people, may lead to all its complications. Obesity presents a special case for nutritional intervention and management. It is well-established that early attention to food habits and nutritional choices may greatly benefit obese individuals, either by helping them achieve a more normal body weight or by preventing or delaying the development of abnormal pathophysiological states, such as diabetes, cardiovascular disease, and certain forms of cancer.

In the past decades, there has been an explosion of knowledge in medicine. Not only have numerous new, very effective drugs been developed, but we have developed a much better understanding of the important role of nutrition in either preventing disease or in the overall management and treatment of existing diseases. For example, the treatment of the genetic disease, phenylketonuria, which has allowed these individuals to grow and develop normally, was made possible through the development of a low-phenylalanine diet. Other inherited diseases, such as hyperlipidemia, require special attention to the amount of fat consumed in the diet.

The medical and nutritional management of diseases, such as obesity and diabetes, presents a special place for food additives such as high-intensity sweeteners, which replace sugar in foods and provide essentially no caloric value. Dietary intervention can be a cornerstone of treatment of these diseases and reduction in caloric intake is usually necessary. This is particularly important in the case of diabetic patients, where sucrose may lead to unwanted, large fluctuations in blood glucose concentrations. In addition, in the case of the obese Type II diabetic patient, weight loss is the mainstay of management. In countries such as the U.S., a large percentage of healthcare resources are spent on the treatment of chronic diseases. However, the *prevention* of such chronic diseases could be much more cost effective.

The high-intensity sweetener, NutraSweet® brand sweetener (generically known as aspartame) presents an unique opportunity for such nutritional management because of its unparalleled safety profile, sugar-like taste, functionality in foods, and demonstrated usefulness in weight management. NutraSweet® (L-aspartyl-L-phenylalanine methyl-ester) has the clean, sweet taste of sucrose; but, it provides negligible calories to foods. It is used in a wide variety of foods, such as carbonated soft drinks, yoghurt, chewing gum, and table-top sweeteners. Thus, incorporation of such foods into a balanced diet allows consumers to enjoy the sweet taste of sugar without the calories. This is especially important for obese individuals since NutraSweet, when incorporated into a comprehensive weight loss programme including rare well decreased energy intake, exercise and behaviour modification, may facilitate weight loss and long term weight maintenance.[1-5]. Unlike fermentable carbohydrates, NutraSweet does not promote tooth decay.[6-12]. Furthermore, because NutraSweet has no effect on blood glucose homeostasis,[13-17] it can be a valuable adjunct to the nutritional management of diabetics, including children, allowing them to enjoy sweet foods without affecting their diabetic control.

### The metabolism of NutraSweet

High-intensity sweeteners, such as saccharin, cyclamate, and acesulfame-K, are xenobiotic compounds. That is, they are foreign to the human body; they are not metabolised to produce energy and they do not serve as functional or structural constituents in the body.

On the other hand, NutraSweet is fundamentally different in that it is metabolised by the digestive enzymes (such as esterases and peptidases) in the gastrointestinal tract to three naturally-occurring dietary components - the amino acids, aspartic acid and phenylalanine, and the methyl ester forms a small amount of methanol (no different from the methanol formed from the abundant methyl esters in fruits and vegetables) (Figure 1). For this reason, NutraSweet may very well be considered a nutritive sweetener with a very high sweetness potential. These three common dietary components are then utilised in the same manner as when they are derived from other dietary sources such as meats, milk, fruits, and vegetables.[18] Furthermore, the normal diet provides much greater amounts of these three components than does NutraSweet in products (Figure 2). For example, a glass of milk provides approximately 6 times more phenylalanine and 13 times more aspartic acid than the amount obtained from an equivalent volume of beverage sweetened with NutraSweet.[19,20] A serving of orange juice provides about the same amount of methanol as in an equivalent volume of NutraSweet-sweetened beverage.[21] Thus, NutraSweet is an insignificant source of these three common dietary components.

### Safety testing in animals

Before approval by the World Health Organization and regulatory agencies in over 100 countries throughout the world, NutraSweet was exhaustively tested. A comprehensive battery of toxicology studies in several animal species was done to predict the safe level of NutraSweet consumption in humans. These studies included acute, subacute, and chronic toxicity studies as well as lifetime carcinogenicity studies. In addition, research evaluated whether NutraSweet had any reproductive or teratogenic effects. The results of these studies documented that there were no compound-related embryotoxic, teratogenic, carcinogenic or other toxic effects of NutraSweet.[22] Pharmacological studies in animals showed no effects of NutraSweet on the central nervous, gastrointestinal, endocrine or reproductive systems or on inflammatory response at doses greatly exceeding those possible from human consumption.[23-27] Based on the results of the toxicology studies, a no-observed-effect level (NOEL) of greater than 2,000 to 4,000 mg/kg body weight was established for NutraSweet.

### Safety testing in humans

Prior to regulatory approval, the safety of NutraSweet and of the plasma concentrations of its components was extensively evaluated in healthy children and adults, as

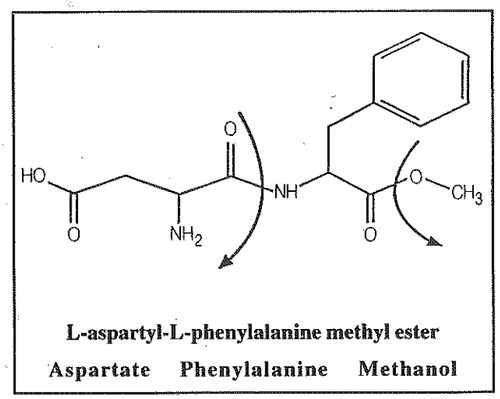



Figure 1: NutraSweet is metabolised by enzymes in the gastrointestinal tract to three naturally-occurring dietary components - aspartic acid, phenylalanine and methanol.

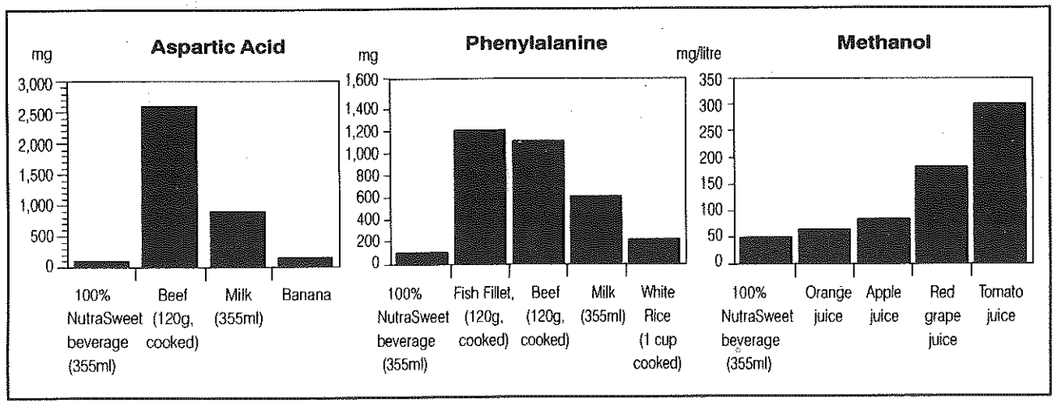
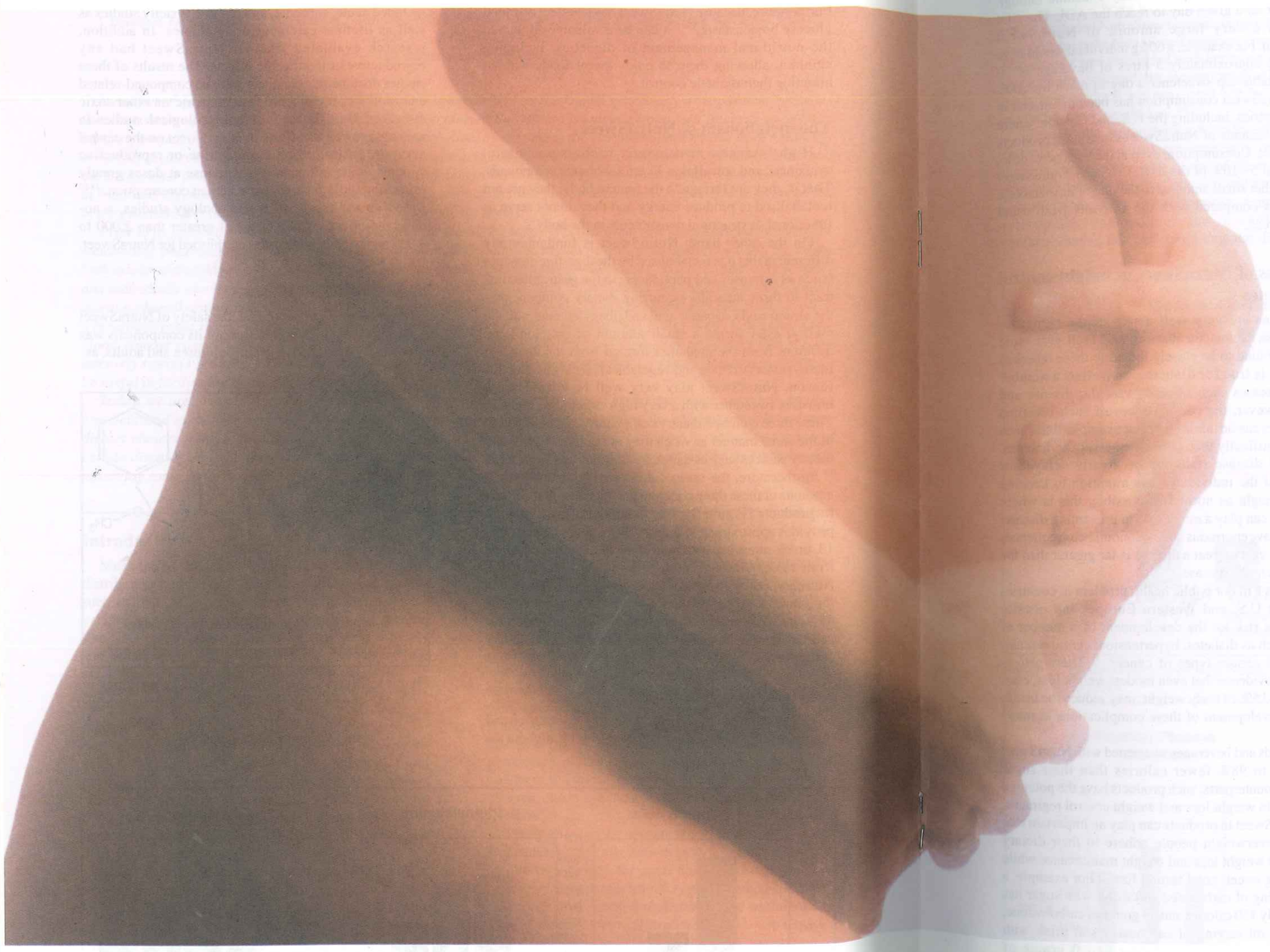



Figure 2: Common foods provide much greater amounts of aspartic acid, phenylalanine and methanol to the diet than does NutraSweet in products.

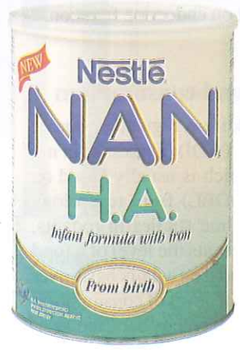
**Important Notice.** The World Health Organization (WHO*) has recommended that pregnant women and new mothers be informed of the benefits and superiority of breast-feeding — in particular the fact that it provides the best nutrition and protection from illness for babies. Mothers should be given guidance on the preparation for, and maintenance of, lactation, with special emphasis on the importance of a well-balanced diet both during pregnancy and after delivery. Unnecessary introduction of partial bottle-feeding or other foods and drinks should be discouraged since it will have a negative effect on breast-feeding. Similarly, mothers should be warned of the difficulty of reversing a decision not to breast-feed. Before advising a mother to use an infant formula, she should be advised of the social and financial implications of her decision: for example, if a baby is exclusively bottle-fed, more than one can (450g) per week will be needed, so the family circumstances and costs should be kept in mind. Mothers should be reminded that breast-milk is not only the best, but also the most economical food for babies. If a decision to use an infant formula is taken, it is important to give instruction on correct preparation methods, emphasizing that unboiled water, unboiled bottles or incorrect dilution can all lead to illness. *See International Code of Marketing Breast Milk Substitutes, adopted by the World Health Assembly in Resolution WHA 34.22, May 1981. SIFECS (MOH)/605/94 NANA 4017A PDA

Nestlé
Specialists in infant nutrition.



# *One name suits every baby.*

NEW




NAN H.A. is a new starter formula from Nestlé. Its unique formulation makes it suitable for all babies, especially those with potential food intolerance or allergy.

Studies have shown that 15-20% of the general population may develop an allergy before the age of seven.[1,2] Babies from families with a history of allergy are especially at risk.

Exclusive breastfeeding is the best way to protect a baby from allergies. But when breastfeeding is not possible, it's good to know that NAN H.A. has been formulated to be "hypoallergenic" — to offer protection from food intolerance and allergies.

In NAN H.A., the cow's milk protein — the main source of food allergies in babies — has been broken down. This makes NAN H.A. well tolerated by babies.

New NAN H.A. from Nestlé. Make it your recommendation.

Nestlé H.A. Care

References: 1. Blair, H. The incidence of asthma, hay fever and infantile eczema in an East London group practice of 9145 patients. *Clin Allergy*. 4: 389-399, 1974. 2. Kjellman, N.I.M. Atopic disease in seven-year-old children. *Acta Paediatr Scand*. 66: 465-471, 1977. Nestlé Singapore (Pte) Ltd 200 Cantonment Road, #03-01 Southpoint, Singapore 0208.

as in obese individuals and diabetics, who would likely to be enthusiastic users of NutraSweet. In addition, the safety of NutraSweet use by individuals heterozygous for phenylketonuria was evaluated. Individuals with the autosomal recessive disease phenylketonuria (PKU) are homozygous for a defect in the gene coding for the liver enzyme, phenylalanine hydroxylase. As a result, they cannot metabolise dietary phenylalanine normally, and plasma phenylalanine concentrations are elevated as much as 20 - 50 times normal. Severe mental deficits will occur if PKU is not identified shortly after birth and treated with a special diet severely restricting intake of phenylalanine. [19] On the other hand, individuals who are heterozygous for PKU are healthy, and restriction of dietary phenylalanine is neither required nor recommended. However, because PKU heterozygotes have a somewhat decreased ability to metabolise dietary phenylalanine, there was concern that NutraSweet could potentially increase plasma phenylalanine concentrations to harmful levels in these individuals. [19] Thus, a number of studies were done to evaluate NutraSweet safety in PKU heterozygotes.

Studies lasting up to 27 weeks with doses up to 135 mg/kg/day of NutraSweet in healthy adults, [28-29] healthy adolescents and children, [30] obese individuals, [31-33] adult diabetics, [15] and adult PKU heterozygotes [34] demonstrated that enormous doses of NutraSweet are not associated with adverse health effects. Studies using acute bolus doses of 34 - 200 mg/kg (equivalent to the adult consumption of approximately 4 to 24 litres of NutraSweet-sweetened beverage at one time) were done in healthy adults, [35-37] one-year old infants, [38-39] individuals heterozygous for PKU, [40-41] and lactating women. [42] For example, bolus doses of 34 mg/kg of NutraSweet resulted in no changes in plasma concentrations of aspartic acid and methanol; plasma phenylalanine concentrations approximated the normal postprandial range. [35,37]

More recently, human studies demonstrated that large, repeated doses of NutraSweet (600 mg every hour for 8 hours) given to healthy and PKU heterozygous adults resulted in no detectable changes in plasma concentrations of aspartic acid and methanol; plasma phenylalanine concentrations approximated the normal postprandial range.[43-44] This amount of NutraSweet is equivalent to that in approximately 10 litres of beverage over 8 hours. In addition, a tolerance study done in healthy adults given 75 mg/kg/day of NutraSweet or placebo for 24 weeks[45] demonstrated that long term, high-dose NutraSweet is not associated with adverse health effects. Other recent studies have confirmed the safety of NutraSweet in individuals with chronic renal[46] and liver disease[47] and further demonstrated no effect of NutraSweet on endocrine function.[48]

## Acceptable daily intake and consumption

Prior to approval of a food additive, regulatory bodies assign an acceptable daily intake (ADI) (expressed in mg of additive/kg body weight), which is usually based on the no-observed-effect level (NOEL) from toxicology studies in animals, usually lifetime studies in rodents, divided by 100. [49] The ADI represents the level of a food additive that can be safely consumed on a daily basis over a lifetime; it is not a maximum safe level of consumption on a given day. Based on animal toxicology data, the Joint Expert Committee for Food Additives of the Food and Agriculture Organization/World Health Organization (JECFA) established an ADI for NutraSweet of 40 mg/kg/day. [50]

It is unlikely that a person may consume enough NutraSweet on a given day to reach the ADI. The ADI represents a very large amount of NutraSweet consumption. For example, a 60 kg individual would have to consume approximately 5 litres of beverage or 70 packets of table-top sweetener a day to reach the ADI. Actual NutraSweet consumption has been monitored in several countries, including the U.S. and Canada, where there are thousands of NutraSweet-containing products on the market. Consumption, even at the 90th percentile, is only about 5 - 10% of the ADI. [51-52] Thus, NutraSweet provides rather small amounts to the diet of its metabolic components compared with the amounts from usual dietary sources.

## Usefulness of NutraSweet in weight control and diabetes

Physicians are very well aware of the numerous inherited risk factors for disease, and each year more diseases are fund to be closely linked to these inherited traits. This is true for diabetes, as well as a number of other diseases such as cardiovascular disease and cancer. However, the consequences of such inherited risks at times can be minimised. For example, it has been shown scientifically that, in people at risk for diabetes, the clinical disease state can be greatly delayed or moderated if the individual pays attention to keeping the body weight as normal as possible; this is where NutraSweet can play a major role in preventing disease. This could have enormous socioeconomic consequences because the cost to treat a disease is far greater than the cost to prevent the disease.

Obesity is a major public health problem in countries such as the U.S. and Western Europe, and obesity increases the risk for the development of a number of diseases, such as diabetes, hypertension, cardiovascular disease, and certain types of cancer. [53] There also is compelling evidence that even modest weight loss, even as little as 5-15% of body weight, may reduce the health risks and development of these complications in many people. [54-55]

Since foods and beverages sweetened with NutraSweet provide up to 98% fewer calories than their sugar sweetened counterparts, such products have the potential to be of use in weight loss and weight control regimens. Thus, NutraSweet in products can play an important role in helping overweight people adhere to their dietary regimens for weight loss and weight maintenance while still enjoying sweet, good tasting foods. For example, a 355 ml serving of carbonated soft drink with sugar has approximately 150 calories and 39 grams of carbohydrate, while a 355 ml serving of carbonated soft drink with NutraSweet has only 0 calories and 0 grams of carbohydrate. Likewise substitution of two spoons of table sugar by a packet of NutraSweet table-top sweetener saves 7 grams of carbohydrate and 28 calories (Figure 3).

In order to evaluate the role of NutraSweet in weight control regimens, Blackburn and co-workers studied obese women who participated in a 16 week active weight loss programme followed by a 3 year maintenance of weight loss period. They evaluated whether the addition of foods and beverages sweetened with NutraSweet to a multidisciplinary weight control programme, including decreased energy intake, exercise, and behaviour modification, would result in better weight loss and long-term control of body weight compared with a regimen which excluded NutraSweet-containing products. Among individuals on the NutraSweet regimen, consuming more NutraSweet was associated with better weight loss. The study results indicated that incorporation of NutraSweet-containing products was associated with better long-term maintenance of weight loss. [1-5]

These results demonstrating NutraSweet's usefulness in body weight control are especially important for diabetic patients. Diabetes is one of the most common and debilitating of medical illnesses and usually leads to complications such as nephropathy, neuropathy, and retinopathy and an increase in cardiovascular, cerebrovascular, and peripheral vascular disease. Some restriction of intake of simple sugars contributes to a better controlled blood glucose concentration, which is directly linked to a more favourable overall management of that disease. It is generally agreed among authorities in the field of diabetology that the better a patient is controlled, the less likely he or she will develop the well-known deleterious complications of diabetes. Further, weight reduction is considered vital to the medical management of the obese, non-insulin-dependent diabetic.

In order to evaluate the safety of NutraSweet in diabetic individuals, a number of studies [13-17] were done with NutraSweet in diabetics to determine whether it has any effect on blood glucose homeostasis. In double-blind, placebo-controlled studies of 13 - 18 weeks duration, both insulin-dependent and non-insulin-dependent diabetics were given large amounts of NutraSweet (up to 2,700 mg/day). NutraSweet had no effect on fasting [13,15] or 2-hour postprandial glucose concentrations or on

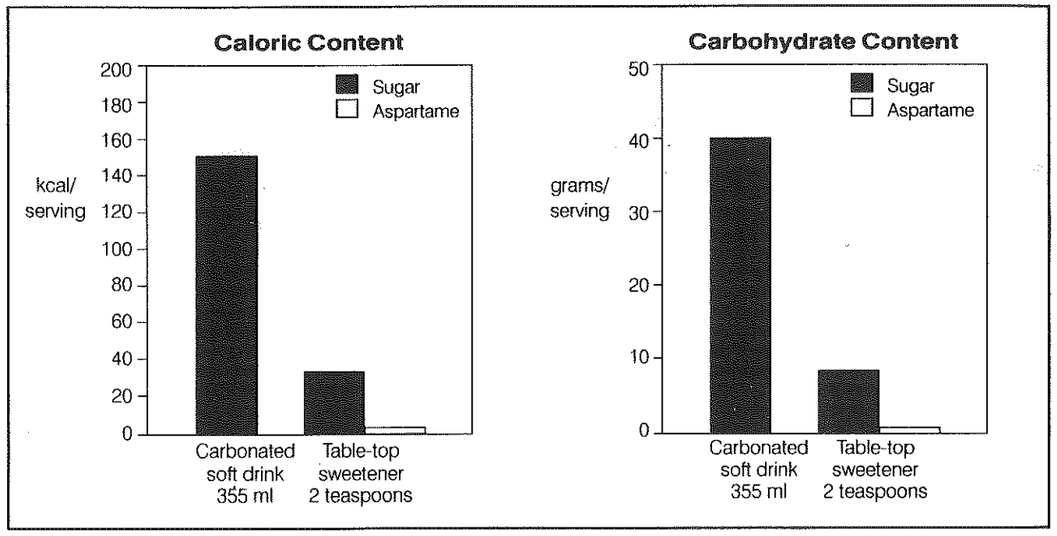



Figure 3: Products sweetened with NutraSweet rather than sugar have significantly less caloric and carbohydrate contents.

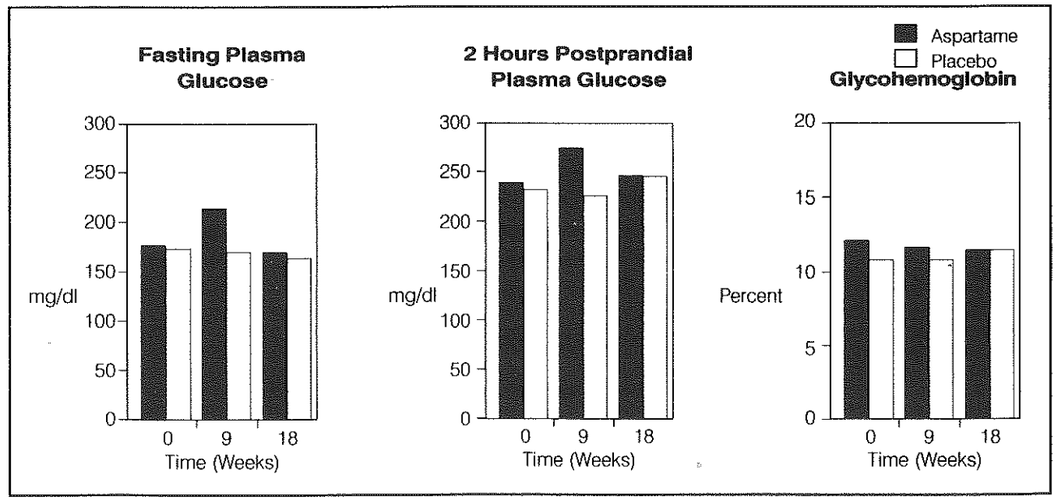



Figure 4: NutraSweet has no effect on blood glucose homostasis in individuals with diabetes. (From: Nehrling et al., Diabetes Care 1985; 8(5):415-417).

glycohemoglobin concentrations.[13] More recently, Horwitz et al. [14] reported no effect of an acute bolus dose of NutraSweet on plasma glucose, insulin and glucagon concentrations in non-insulin-diabetic subjects (Figure 4). Thus, NutraSweet has no effect on glycemic control in diabetic subjects and can be incorporated safely into diabetic meal plans.

## Conclusion

NutraSweet is unique compared with other high-intensity sweeteners because it is metabolised in the gastrointestinal tract to three naturally-occurring dietary components - aspartic acid, phenylalanine, and methanol. NutraSweet has been extensively tested through numerous studies in both animals and humans. The scientific data have established that NutraSweet is a safe food additive for the general population, including children and pregnant women. Because NutraSweet provides the clean, sweet taste of sugar without the calories, it can be used in foods to reduce calories and carbohydrate significantly. This may be especially important for diabetics and people who want to lose weight or maintain optimal body weight. With the recent increase in cultural exchanges worldwide, including new foods, such foods may be helpful to the people of Singapore in helping to prevent the chronic diseases associated with a more Western diet.

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# Eleventh Annual General Meeting of the SNDA

## Saturday 22 April, 1995

The 11th annual general meeting of the Singapore Nutrition and Dietetics Association was held at Gleneagles Hospital, Lecture Theatre from 1.30 - 4.30 pm. The meeting was sponsored by Encore Asia Pacific Pte. Ltd.

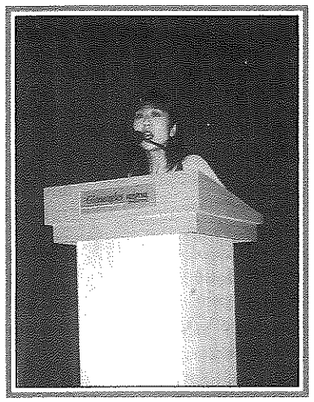
The programme started with a presentation on "The science behind the labels: An insight into the US experience" by Ms. Annie Ling, Nutritionist and Head of the Consultation and Surveillance Section, from the Food and Nutrition Department, Ministry of Health.

The business meeting followed with a message from the President, Mrs. Lynn Alexander updating all members about the past year's activities. Updates were made by the Chairpersons of the editorial and the continuing education sub-committees.

The election of office bearers for the year 1995 - 96 was held. The newly elected main committee members are:

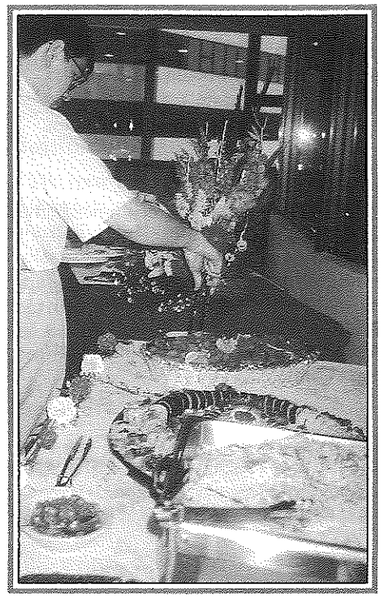
| | | |
|---|---|---|
| President | : | Lynn Alexander |
| Vice-President | : | Anna Jacob |
| Hon. Secretary | : | Sue Hixson |
| Hon. Treasurer | : | Inge Hager |
| Committee Members | : | Ang Kai Ling |
| | | Yashna Harjani |
| | | Margaret Hays |
| | | Louisiawati Khalil |
| | | Khoo Poh Lai |
| | | Leow Sooi Mee |
| | | Lydia Loy |
| | | Lisa Ooi |
| | | Sue Pritchard |
| | | Toh Hui Kheng |
| | | Louisa Zhang |

*Main committee members (from left: Sue Hixson, Lynn Alexander, Annie Ling, Lisa Ooi) at the business meeting.*

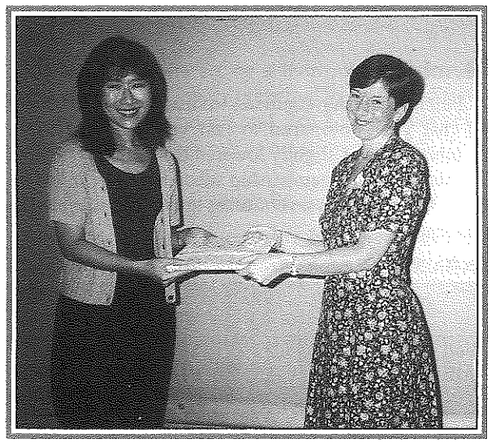


*Annie Ling presenting the paper on "The science behind the labels".*

The meeting ended with the traditional lucky draw for gifts sponsored by several local and multinational companies. Every member also left with a bag of lovely goodies containing healthy foods and supplements.



*The lovely spread of food at the annual general meeting.*



*Lynn Alexander presenting a memento to Annie Ling after the presentation.*

# President's Annual Report 1994-95

## The year in review

This year SNDA turned 10! It has been a very full and exciting year, with the dedicated main committee members and various subcommittee members and other volunteers working very hard to participate in many activities. As usual we had to say goodbye to some active members who were leaving Singapore, but we are pleased that many new members who joined recently have expressed interest in becoming actively involved in the Association's programmes.

This year we continued to forge links with important local and overseas associations. We are now a member of the Federation of Asian Nutrition Associations, and continue to play a role on the Executive Committee of the Asian Federation of Dietetics Professionals. Locally, we worked on various projects with Diabetic Society of Singapore, Perinatal Society of Singapore, Singapore Sports Council, Ministry of Health. Food and Nutrition Department, Singapore Medical Association and International Life Sciences Institute SE Asia.

## The 1994/1995 Central Committee

The Committee was elected to office at the Annual General Meeting in April 1994. The elected committee members were:-

| | | |
|---|---|---|
| President | : | Lynn Alexander |
| Vice-President | : | Annie Ling |
| Hon Secretary | : | Sue Hixson |
| Hon Treasurer | : | Lisa Choi |
| Committee Members | : | Selena Chan |
| | | Bridget Fenby |
| | | Ho Fong |
| | | Yashna Harjani |
| | | Margaret Hays |
| | | Khoo Poh Lai |
| | | Christa Koenig |
| | | Yeong Boon Yee |
| | | Louisa Zhang |

A total of eleven central committee meetings were held in 1994/95.

## Membership

Full membership continues to steadily increase, being 63 this year compared to last year's 60. Affiliate membership was slightly lowered from last year's 30 to 28 this year. The membership subcommittee chaired by Lynn Alexander met several times to evaluate membership applications.

SNDA Membership

| *Category* | *1990 /91* | *1991 /92* | *1992 /93* | *1993 /94* | *1994 /95* |
|---|---|---|---|---|---|
| Full | 48 | 52 | 56 | 60 | 63 |
| Affiliate | 51 | 55 | 63 | 30 | 28 |
| TOTAL | 99 | 107 | 119 | 90 | 91 |

## Tenth Anniversary Programmes

A number of special projects/events ensured that we did not let our tenth anniversary year pass by unmarked! One of the most ambitious projects SNDA has ever embarked on was realised in the form of the **"SNDA Pulses and Grains Cookbook"**. A subcommittee, under the capable leadership of Yashna Harjani, took on the project, first begun by the 1993/94 main committee, to its successful completion, and 2000 copies were published in September 1994. The SNDA cookbook, the first publication of its kind from our Association, is truly something we can be proud of. It is a fitting and lasting memento to our tenth anniversary.

A special scientific seminar was also organised as a celebration of our ten years. More details of the topic and speakers are given below. In addition to having two overseas US speakers address us at this event, we also had the pleasure of having Mr. Garry Wainscott to chair the meeting. Mr. Wainscott was instrumental in the founding of SNDA and so it was very apt that he was present to help us celebrate our first ten years.

## Professional/academic meetings 1994/95

A total of 9 professional meetings were held this year. These were:

1. 27 May, 1994
   Joint meeting with Perinatal Society of Singapore
   "Infant and child feeding practices - Implications on growth and health"
   by Prof. K. L. Tan
   and Dr. D. Cotter (USA)
   Accredited 1 CE point

2. 28 July, 1994
   "Osteoporosis: Are Asian women more at risk?"
   by A/Professor Shamal Dasde
   Accredited 1 CE point

3. 19 August, 1994
   Joint meeting with ILSI SE Asia
   "Dietary fats: Recent findings and recommendations. Special update on trans fatty acids"
   by Dr. Onno Korver (Netherlands)
   Accredited 1 CE point

4. 12 September, 1994
   "Carotenoids: How important to the infant diet?
   by Dr. Louisa Canfield (USA)
   Accredited 1 CE point

5. 30 September, 1994
   Joint meeting with Food and Nutrition Department, MOH
   "Eat more fruit and vegetables - The scientific rationale"
   (i ) Eat more fruit and vegetables - The scientific rationale
   by Mrs. Anita Owen (USA)
   (ii ) Fruit and vegetables intake in the US: Current consumption patterns and goals
   by Dr. Wang May Choo (USA)
   (iii ) Fruit and vegetables purchasing and consumption pattern in Singapore - How do we measure up?
   by Mrs. Chan-Yam Yoke Yin
   Accredited 1 CE point

6. 5 November, 1994
   (i ) "Highlights of the 1st Asian Conference on Dietetics, Jakarta"
   by SNDA-sponsored members
   (ii ) "Highlights of the ADA 77th Annual Meeting"
   by Mrs. Sue Hixson
   Accredited 1 CE point

7. 17 November, 1994
   "The Role of Nutrition Support in Liver Disease"
   by Ms. Denise Schwartz (USA)
   Accredited 1 CE point

8. 10 April, 1995
   Joint meeting with Diabetic Society of Singapore
   Scientific Symposium on "Diet and diabetes: Current issues and future directions"
   (i ) Overview of diabetes mellitus prevalence and treatment in Singapore
   by Dr. John Tambyah
   (ii ) Update on diabetes research trends and latest US diet guidelines
   by Dr. Edward Horton (USA)
   (iii) High intensity sweeteners: Overview of safety and toxicology
   by Dr. John Thomas (USA)
   (iv) Aspartame: An overview of metabolism, safety and usefulness
   by Dr. Christian Tschanz (USA)
   Accredited 1 CE point

9. 22 April, 1995
   SNDA Annual General Meeting
   "The science behind the labels - An insight into the US experience"
   by Ms. Annie Ling
   Accredited 1 CE point

## Continuing Education (CE)

The second two year cycle ended in 1994. A total of 12 members received the continuing education certificate awarded jointly from SNDA and the Singapore Professional Centre. Thanks go to Ms. Georgina Stable for ably chairing this Subcommittee. Since Georgina's departure from Singapore earlier this year, Ms. Sue Pritchard has been appointed the new CE Committee Chairman.

## Singapore Professional Centre

Ms. Sue Hixson continued to represent SNDA on the SPC Council. Once again, SNDA took part in the annual Career Exhibition, and was represented in a dialogue session with MP Mr. Wong Kan Seng.

## The Singapore Journal of Nutrition and Dietetics

Two special tenth Anniversary issues of the journal were published in June and December under the direction of Mrs. Anna Jacob. The June issue focused on eating disorders in Singapore, and the December issue highlighted the association's various activities during the year, notably the participation in the Fruit and Vegetables Week and the 1st Asian Conference on Dietetics.

## Working Committee on Promoting Healthy Eating in Hospitals

SNDA was represented on this working group by Lynn Alexander. A handbook on "Promoting Healthy Eating in Hospitals" was produced by the Committee in November 1994.

## National Diabetes Commission

The Commission's work concluded in 1994 with submission of a final report to the Minister of Health. The recognition of the dietitian as one of the key members of the Diabetes Health Care Team, and the corresponding need for more dietitians in Singapore were stressed.

## 1st Asian Conference on Dietetics, Jakarta, 2-5 October 1994

A total of 13 dietitians and nutritionists from Singapore attended this important conference. SNDA arranged full sponsorship for four members. Ms. Fong Mei Lin, Ms. Beatrice Pung, Ms. Selena Chan and Ms. Ong Eng Gim, and partially sponsored (registration fees only) 2 members, Ms. Leow Sooi Mee and Mrs. Anna Jacob.

Three SNDA members were invited by the conference to give symposia papers and two members presented free communications.

## National Healthy Lifestyle Campaign 1994: "Fruit and Vegetables Week"

SNDA participated in the "Fruit and Vegetables Week" organised by Food and Nutrition Department, MOH, during the 1994 Healthy Lifestyle Campaign, to promote the eating of more fruit and vegetables. We set up and manned a booth for two days at Ngee Ann City, Civic Plaza. Besides giving out nutrition leaflets and answering the public's enquiries on nutrition, members conducted nutrition quizzes and gave away apples and dried fruit as prizes.

## Family Learning Carnival, 25 September 1994

SNDA volunteers set up a nutrition booth at this carnival which was jointly organised by the Association of Childcare Educators and Pre-school Teachers' Association.

## Survey on dietary guidelines

SNDA was commissioned by Food and Nutrition Department (FND), MOH, to carry out a survey of its members on the viewpoints concerning the local dietary guidelines. SNDA appointed Margaret Hays to conduct the survey and the results were duly collated and presented to the FND in January 1995.

## Programmes for 1995/96

Programmes for the new year begin on 23 May 1995, with SNDA's participation in the Singapore Medical Association's Public Convention. We will have a booth

where our materials will be displayed, and members can answer queries on nutrition from the public. In August we hope to organise a meeting on Diet and Cancer, with a visiting speaker from US. In September this year, SNDA is collaborating with ILSI SE Asia, who is organising the 1st International Conference "East-West Perspectives on Functional Foods". In October we hope to send some delegates to the 7th Asian Congress on Nutrition, in Beijing, and likewise to the 12th International Dietetics Congress in Manila, the Philippines. Locally we will be forming a subcommittee to look into guidelines for Sports Nutrition. We will also be updating our Position Statement on Dietary Management of Diabetes.


## Acknowledgements

The Association wishes to sincerely thank all the members of the various committees and all who have volunteered to help in the different activities over the year. Appreciation is also recorded to the sponsors who have helped us financially with our various projects, including the cookbook sponsors, the journal advertisers, the overseas conference sponsors and sponsors of professional meetings, including the AGM


As SNDA moves into its second decade, it is encouraging to see the increased level of enthusiasm and involvement from the members, and I am confident that we continue to grow and mature as a professional body.

Lynn Alexander

**Lynn Alexander**
President
1994/95

# Singapore Nutrition and Dietetics Association

## APPLICATION FOR MEMBERSHIP

Application forms are available from the Honorary Secretary, Singapore Nutrition and Dietetics Association, Tanglin P.O.Box 180, Singapore 9124.

### MEMBERSHIP

**Full members** must hold a degree, diploma or any other recognised professional qualification in dietetics or nutrition. Please assist us in processing your application by submitting the following:-

1. A copy of degree/diploma
2. Course syllabus and description
3. Transcripts
4. Other supporting information such as work experience and verification statement from other dietetics/ nutrition associations.

**Affiliate members** shall be any person who, in the opinion of the Committee, holds a scientific qualification in medicine, health or food science and occupies a position allied to the profession of dietetics, and/or nutrition.

**Corporate members** shall be any suitable corporate body interested in work of the Association and in the promotion of dietetics and nutrition.

Persons eligible for full membership shall not be entitled to affiliate membership.

### MEMBERSHIP FEES (fiscal year is June-May)

Full members shall be required to pay an annual membership fee of $60.00. Full members joining part of the way into the year may pay a pro-rated subscription, this being calculated from the beginning of the month after membership is confirmed.

Affiliate members shall be required to pay $20.00 per annum. Affiliate members joining in the second half of the year (Dec-May) may pay $10.00.



# NEW BOOKS

### CLINICAL PAEDIATRIC DIETETICS
Vanessa Shaw and Margaret Lawson

Publishers: Blackwell Scientific Publications
Osney Mead, Oxford OX2 OEL, UK
Tel: (0865) 206206 Fax: (0865) 206096

Clinical Paediatric Dietetics provides a practical approach to the nutritional management of an extensive range of paediatric disorders which may be encountered in the hospital or community. The text is comprehensive and deals with a whole spectrum of disorders. Much of the information included is in tabular form and the appedices list the special products described in the text, together with details of manufacturers.

368 pages, hardback, £39.50. (ISBN 0632036834) SNDA and BDA members £29.50.

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### HANDBOOK OF PREVENTIVE AND THERAPEUTIC NUTRITION
James M. Gerber, MS, DC.

A pocket guide to nutrition therapy - the book includes clinical protocols for using nutrition in the prevention and treatment of common disorders, quick information on macro and micro-nutrients and methods for clinical assessment.

Available from Aspen Publishers Inc., PO Box 990, Frederick MD 21705 - 9782, USA. Cost US$39.00.

### SPORTS NUTRITION - SELF STUDY COURSE
Kathy King Helm

This course aims to assess and instruct registered dietitians in the core knowledge of sports nutrition and the practice challenges that uniquely confront a sports nutrition specialist.

Available from Aspen Publishers Inc., PO Box 990, Frederick MD 21705 - 9782, USA. Cost US$69.00.

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### CATALOGUE OF NUTRITION RESOURCE MATERIALS

This catalogue is recommened for anyone interested in nutrition education and promotion. Listed in it is a whole range of materials namely, booklets and pamphlets, posters and exhibition panels, video and computer programmes. Topics range from healthy eating in different age groups, weight management, quick and easy recipes to catering guidelines. Each title is followed by a brief description of content, the languages the material available in, and a code reference number which indicates the year the material was last produced.

For a free copy of this catalogue (17 pp; A5), just send in a self-addressed, stamped enveloped to the address below:

Resource Catalogue
Food and Nutrition Department
Blk 3 Level 4
226 Outram Road
Singapore 0316

## CAREER AND EDUCATIONAL OPPORTUNITIES

*Advertisement for Dietitian (Hong Kong)*

The Hospital Authority is a statutory body established on 1 December 1990 to serve the people of Hong Kong. With over 42,000 staff in our 40 public hospitals and institutions we are committed to improve local healthcare service.

We value staff as our most important asset and we offer rewarding, fair and challenging employment. We have the following opening:

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Up to S$75,700 pa* + 15% gratuity + Monthly Cash Allowance at 16.5% of basic monthly salary

- Low tax area - maximum 15%
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- Free return air passages
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- Possibility of arrangement for accommodation

**Qualifications:**
Applicants should have (a) a degree or a post-graduate Diploma in Dietetics recognised by the British Dietetic Association, for membership, or equivalent and (b) good spoken and written English; and (c) preferably speak fluent Cantonese.

**Duties:**
1. To give consultative dietetic services to physicians, surgeons and their patients;
2. To participate in in-service dietetic courses and projects;
3. To give lectures to nurses on nutrition, and to Government departments on requests;
4. To supervise the production of therapeutic diets for in-patients in public hospitals; and
5. To assist with the supervision of hospital kitchens and staff therein for the production of normal diets for the in-patients in public hospitals whenever necessary prior to the detachment of patients food service from dietetic service.

**Terms of Appointment and Salary:**
Agreement terms, initially for 1 to 3 years. The salary scale is HK$17,290 to HK$34,690 per month (approximately S$37,700 to S$75,700* per annum).

Applications with full curriculum vitae and copies of diplomas certificate should be sent, on or before **31 August 1995** to:

Hospital Authority
Manpower Planning & Resourcing Section (Team 2)
14/F Hennessy Centre
500 Hennessy Road
Causeway Bay
HONG KONG
Fax: 852 2890 4266

* Based on exchange rate HK$5.50 = S$1.00 (subject to fluctuation)

**M.Sc in Health Care Management**
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Swansea

Two Year Distance Learning Programme

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Loh Peng Yim
Manager
Distance Learning Division
EMS International
1 Selegie Road
#06-27 Paradiz Centre
Singapore 0718
Tel: 3388965

**Intensive Course in Paediatric Nutrition**
University of Iowa

November 6 - 10, 1995

For paediatricians, nutritionists dietitians, nurses, and other professionals with interest in infant nutrition.

Registration fees: US$200.00 (non-refundable)

For more information, contact:

Samuel J Fomon
Program Director
Professor Emeritus of Paediatrics
The University of Iowa
College of Medicine
200 Hawkins Drive
Iowa City
Iowa 52242 1083
Tel: (319) 356 1831



## • • • *Help us to serve you better* • • •

***Dear Reader,***

*Please spend a few minutes to fill up this form. It will help us to serve you better in the future. Please mail completed forms to The Singapore Nutrition and Dietetics Association, Tanglin P O Box 180, Singapore 9124. We would appreciate hearing from you.*

*Thanks.*

*Editorial Committee*

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Address: .....
.....

1. How long have you received this journal?
   ☐ < 1 year ☐ 1 - 2 years ☐ 2 or more years

2. Are the articles useful and interesting?
   ☐ Yes ☐ No

3. Please rate the articles for the following features:
   Content : 1 ..... 2 ..... 3
   Poor ..... Average ..... Good
   Readability : 1 ..... 2 ..... 3
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   Presentation : 1 ..... 2 ..... 3
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3. What sections do you find useful and interesting?
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5. Would you like to contribute articles to the Journal?
   ☐ Yes ☐ No
   If yes, please provide your name and contact address above.

## SUBSCRIPTION FORM

*(THE JOURNAL IS DISTRIBUTED FREE TO ALL MEMBERS)*

To: The Editor, The Singapore Journal of Nutrition and Dietetics, Singapore Nutrition and Dietetics Association, Tanglin P.O.Box 180, Singapore 9124, Republic of Singapore.

Please enter my name for a one-year subscription (2 issues) of THE SINGAPORE JOURNAL OF NUTRITION AND DIETETICS from Vol. ..... No ..... for which I enclose a cheque/cash/money order for S$8 (US$16 for overseas subscription) inclusive of postage, made payable to: "**Singapore Nutrition and Dietetics Association**".

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# ABSTRACTS

**MOBILIZATION OF VISCERAL AND SUBCUTANEOUS ADIPOSE TISSUE IN RESPONSE TO ENERGY EXPENDITURES AND BODY WEIGHT IN HEALTHY ADULTS.** *The American Journal of Clinical Nutrition, Vol 60, November 1994, 695-703.*

Moderate energy restriction combined with either resistance or aerobic exercise leads to significant losses of both visceral and subcutaneous adipose tissue, especially visceral adipose tissue and is therefore an effective way to reduce total and upper body obesity in women. Twenty four women with upper body obesity (body mass index > 27, waist to hip ratio > 0.85) were randomly assigned to either diet and aerobic exercise (5 days per week) or diet and resistance exercise (3 days per week) for 16 weeks. The diet was calculated to provide a deficit of 1000 Kcal per day, adipose tissue distribution was measured by magnetic resonance imaging. The relative losses of body weight, subcutaneous fat and visceral fat were not significantly different between groups. Both groups showed significant reduction in the ratio of visceral to subcutaneous fat, similar regional reduction in stores of subcutaneous fat, and preferential reduction in stored of subcutaneous fat from the abdominal region.

**MEGADOSE OF VITAMIN C DELAYS INSULIN RESPONSE TO A GLUCOSE CHALLENGE IN NORMOGLYCEMIC ADULTS.** *The American Journal of Clinical Nutrition, Vol 60, November 1994, 735 - 738.*

An elevated plasma level of vitamin C delays the insulin response to a glucose challenge in healthy adults. These results may be partly explained by the competitive inhibition of insulin transfer into pancreatic beta-cells by high concentrations of circulating vitamin C. Nine subjects with normoglycemic (mean age = 22 + years) consumed 2 g vitamin C or placebo for 2 weeks after a 2 week washout period. This 4 week protocol was repeated in a cross-over fashion and subjects underwent an oral glucose tolerance test at the end of each period. Vitamin C saturated subjects had significantly elevated plasma glucose; levels after 2 hours compared with those taking the placebo. The plasma insulin response curve was shifted to the right in vitamin C - saturated subjects relative to the subjects taking placebo: plasma insulin was significantly depressed after 0.5 hours but significantly elevated after 2 hours. The effects of vitamin C supplements on glucose homeostasis should be investigated in subjects with diabetes.

**THE EFFECT OF VOLUME INGESTED ON REHYDRATION AND GASTRIC EMPTYING FOLLOWING EXERCISE - INDUCED DEHYDRATION.** *J.B. Mitchell, P.W. Grandjean, F.X. Pizza, R.D. Starling, R.W. Holtz, cited in Medicine and Science in Sports and Exercise, Vol 26, September 1994, 1135-1143.*

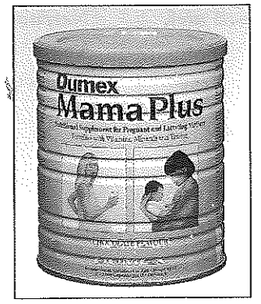
Gastric emptying did not appear to be limiting factor in rehydration, however, forced fluid intake with a dilute rehydration solution was not an effective method of rapid rehydration and may be detrimental to subsequent performance. Nine men (mean age = 27.3 +- 5.47 years, mean weight = 77.8 +- 7.9 kg) exercised for 90 minutes on a cycle ergometer in a hot environment and rested for 30 minutes in a neutral environment. During the next three hours, subjects were rehydrated with an electrolyte solution that provided either 100% or 150% of the fluid volume lost during exercise. Subjects emptied 98.9% and 86.0% of the fluid ingested and retained 55% and 54.6% at the end of rehydration for the 100% and 150% trial respectively. The greater amount of rehydration in the 150% condition involved relatively large gastric fluid volumes and large urine volumes. The large volume of urine produced during both trials indicates that fluid retention hormones were not maintained at an adequate level to stimulate rapid rehydration after dehydration.



PRODUCT UPDATE

# Dumex Mama Plus - The milk for Mothers-to-be

Good news for first-time mothers and mothers-to-be! **DUMEX** (Singapore), a leader in the local milk industry, has just introduced a nutritional milk supplement specially for pregnant and lactating mothers, because healthy mothers have healthy babies.




The birth of a healthy, baby is what everyone expectantly looks forward to. Thanks to nutrition-rich **Mama Plus**, babies will be given the best in life even before they are born. Even women who are just at the planning stage of motherhood are encouraged to take this nutritious drink, so that they are at the peak of health once they become pregnant.

Formulated with 33 nutrients, comprising 15 vitamins, 12 minerals, calcium, anti-oxidant agents like vitamins C, E and selenium, **Mama Plus** is designed to give extra energy and all the goodness a mother and baby need.

**Dumex Mama Plus** is an excellent supplement for career mums and mums-on-the-go. It is also a good alternative to milk as it contains the same high quality proteins found in milk, but has more of the important vitamins and minerals. Taking two glasses of **Mama Plus** daily will meet the increased nutritional needs during pregnancy.

**Mama Plus** also meets the high energy and nutritional requirements of a mother who is breastfeeding.

**Dumex Mama Plus** is chocolate-flavoured, as chocolate is known to please the palate of the pregnant mum. It is available at leading stores and supermarkets, retailing at S$9.60 for a 400g can.

# Frisocrem

Frisocrem is specially formulated in accordance with Recommended International Standards for "Food for infant and children" by the Codex Alimentarius Commission of FAO/WHO.

Frisocrem comes in two preparation: Frisocrem Rice (from 4 months onwards) and Frisocrem Wheat (from 6 months onwards).

It is a complete and easily digestible cereal for your baby. Frisocrem is formulated with milk added. Only addition of water is required in preparation for feeding. It has a very smooth texture and your baby will definitely like it.

Serving suggestions:

i ) plain
ii ) with mashed fruits, mashed carrots or scraped fish
iii ) minced chicken/beef (for older babies only)

# Nutrition Supplements for Moms

Nestlé is proud to introduce Nestlé MOM, a milk supple-ment for pregnant and breastfeeding mothers.


During this period, mothers have increased requirements for energy, vitamins and minerals. And that's what Nestlé MOM can provide.

Good maternal nutrition during pregnancy and lactation is essential for the development of the baby, the health of the mother as well as, the production of milk for subsequent healthy growth and development of the infant.

One to two glasses a day in addition to a balanced diet meet the US Recommended Dietary Allowance for pregnant and breastfeeding mothers.

Available in chocolate and orange flavours at major supermarkets, selected pharmacies and minimarkets.

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**1.** NutraSweet® is made from two building blocks of proteins (also called amino acids) like those found naturally in over half the foods you eat today. Your body treats them no differently than if they came from a peach, tomato or apple.

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For more information, contact:

***NutraSweet Asia***

c/o Monsanto Singapore Co (Pte) Ltd 101 Thomson Road, United Square, #19-00 Singapore 1130 Tel: (65) 3509543 Fax: (65) 3560939

# MEETINGS

**19 - 22 July, 1995**

**3rd International Exhibition on Hotel, Food and Catering Equipment**

**Venue** : Kuala Lumpur

**Contact** : Excel Exhibitions (M) Sdn Bhd
No. 27D, 2nd floor, Jalan Bukit Bintang
55100 Kuala Lumpur
Tel: 03-2440669, Fax: 03-2440670

**18 - 20 September, 1995**

**Australian Tropical Health and Nutrition Conference**

**Venue** : Brisbane, Australia

**Contact** : Wendy Gardiner
Tropical Health Program
The University of Queensland
Medical School
Herston Road, Herston
Queensland 4006, Australia
Fax: 61-7-3655599

**20 - 22 September, 1995**

**2nd International Conference on Nutrition and Aging**

**Venue** : Tokyo, Japan

**Contact** : ILSI Japan
Conference Secretariat
Koike Building
9-11-403, 2 Chome Umezato
Suginami-ku
Tokyo 166, Japan
Fax: 81-33-318-9554

**26 - 29 September, 1995**

**1st International Conference on East-West Perspectives on Functional Foods**

**Venue** : Singapore

**Contact** : ILSI Southeast Asia
1 Newton Road
Goldhill Plaza Podium Block
#03-25, Singapore 1130
Tel: (65) 2558023 Fax: (65) 2558067

**3 - 5 October, 1995**

**5th World Congress on Clinical Nutrition**

**Venue** : Hangzhou, China

**Contact** : Prof. Zhu Shoumin
Research Centre of Nutrition
Zhejiang Medical University
Hangzhou, Zhejiang-310 031
China
Fax: (571) 771571

**3 - 6 October, 1995**

**Nutrition, Body Composition and Ethnicity**

**Venue** : Tianjin, China

**Contact** : Dr Bridget Hsu-Hage
Dept of Medicine, Monash University
Monash Medical Centre
Level 5, Block E, 246 Clayton Road
Clayton, Melbourne
Victoria 3169, Australia
Fax: 61 3 5505524

**5 - 6 October, 1995**

**Nutrition Training Needs in Asia**

**Venue** : Beijing, China

**Contact** : Dr. Aree Valyasevi
Institute of Nutrition
Mahidol University at Salaya
Phuttamonthon 4
Nakhon Pathom 73170, Thailand
Fax: 66 2 24419344

**7 - 11 October, 1995**

**7th Asian Congress of Nutrition**

**Venue** : Beijing, China

**Contact** : Mr. Ma Shi-liang
Chinese Nutrition Society
c/o Institute of Nutrition and Food Hygiene
29 Nan Wei Road
Beijing 100050, China
Fax: 86-1-30-1875

**25 - 27 January, 1965**

**XIIth International Congress of Dietetics**

**Venue** : Manila, Philippines

**Contact** : Secretariat
XII International Congress of Dietetics
Nutritionist-Dietitians' Association of the Philippines
Prince Tower Condominium, Unit 208
14 Tordesillas, Makati
Metro Manila, Philippines
Fax: (632) 815 1935

**27 July - 1 August, 1996**

**16th International Congress of Nutrition**

**Venue** : Montreal, Canada

**Contact** : Secretariat
16th International Congress of Nutrition
National Research Council of Canada
Ottawa, KIA OR6, Canada
Tel: 613 993 9009, Fax: 613 957 9828