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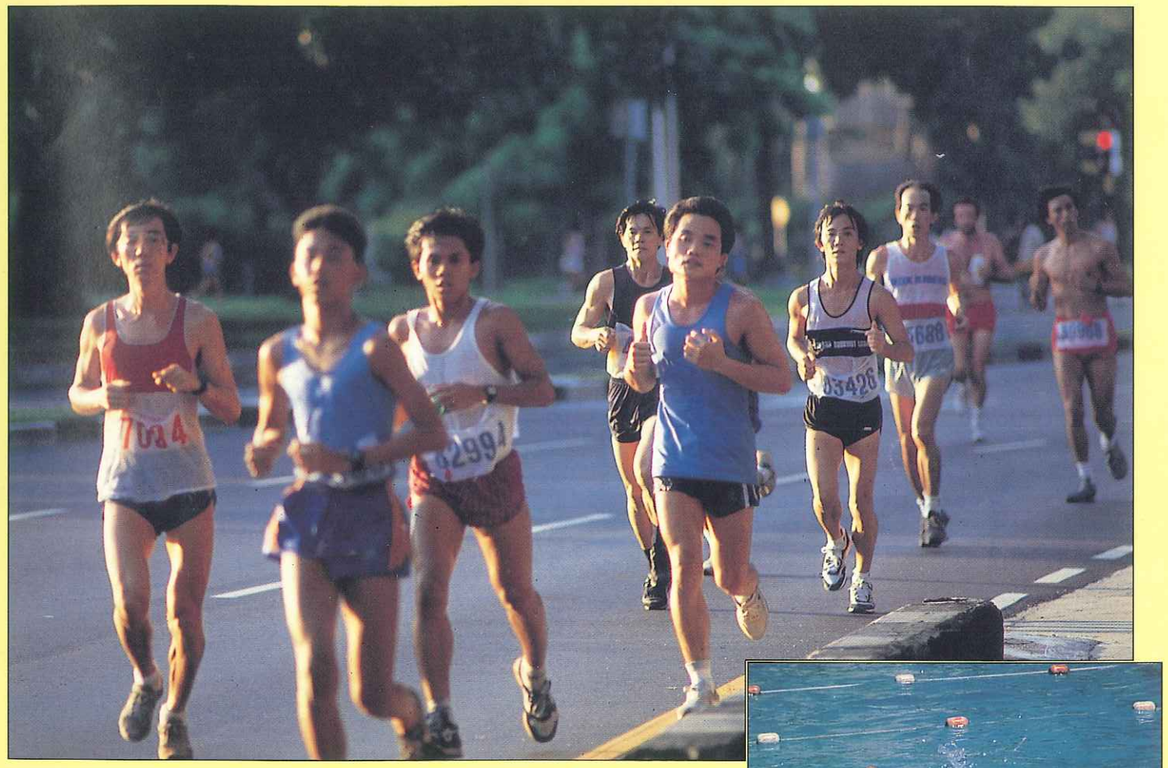
Optimising Sports Performance & Fitness — Through Nutrition



- ***Salmonella Gastroenteritis***
- ***Obesity-Diabetes Connection***
- ***The Healing Foods***

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Singapore Nutrition and Dietetics Association

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A Message From The President

The President's report for 1992-93 summarises our Associations' goals and achievements. My conviction is that teamwork forms the base for garnering support and is the root of all acomplishment. This is amply illustrated by the high quality and enthusiastic teams that serve the Association. This is the true spirit SNDA needs in our transition from "childhood" to "adolescence", moving with time and confidence towards a more demanding 2nd decade.

In preparation for our 10th Anniversary celebration in 1994, the new committee will be working on an agenda that will market and promote our members of profession as the "nutrition experts" to the public. We shall draw on our members' creativity, ability for hard work and sense of fun to come up with an interesting and unique commemorative publication.

For professional enhancement, the Association will continue to forge stronger links with the medical community and food scientists where nutrition research and development are becoming an integral part of the respective sciences. We will also seek to gain greater recognition and equal professional status for dietitians and nutritionists, and actively participate in the national agenda of health promotion and public education. In short, SNDA shall make its presence known in Singapore.

The 17th Southeast Asia Games held this June in Singapore and the hosting of a Sports Nutrition Seminar in conjunction with the International Sports Science Conference sponsored by the Singapore Sports Council and the International Life Sciences Institute (ILSI) has set the stage for a better understanding of the role of nutrition in improving physical performance. With exercise and fitness being the focus of this year's National Health Campaign, this issue of the SNDA journal has taken on the timely theme with two articles to review sports nutrition practices and its future impact in optimising sports performance in the region. It is a new field of knowledge and our dietitians and nutritionists can broaden their scope of practice and play an important role in shaping the new generation of athletes.

Seeking new opportunities and breaking new territories are part of the excitement in their ever evolving field of nutrition and dietetics. Keep on striving!

Yeong Boon Yee
June 1993

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Sports Nutrition — Turning Theory into Practice in Singapore

by Nicola Gilbert BSc (Hons) SRD, RDS.

Worldwide, sports nutrition is becoming a subject of increasing recognition and practice.

With the SEA games only 3 months away, I decided to investigate current attitudes towards food and sport of some Singaporean athletes.

Method

16 sportsmen and women completed a simple questionnaire of 12 questions designed to assess their eating habits and nutritional knowledge.

Sample

The sample consisted of 14 men and 2 women aged between 15 — 31 years old. All athletes trained regularly between 5 — 33 hours each week competing at school, club or national level in a variety of sports ranging from judo to soccer. They all had a body mass index (BMI) within the acceptable range.

Results

14 of the 16 respondents agreed that diet could influence sports performance but only 2 athletes admitted to making any dietary changes to improve their sporting performances.

These dietary changes included eating less fatty, sugary and salty food and eating more carbohydrate rich foods especially from unrefined sources.

Attempts were also made to consume more vegetables, fruits and fruit juices.

Four other athletes had also cut back on salty, fatty food choices and alcohol and were including more milk drinks and water in their diets but these changes were not deliberately made to improve sports performance.

Availability of chosen foods and drinks was not a problem for most athletes.

No one admitted to taking any powder formulas or supplements which claim to improve sports performance. Most athletes chose to consume usual foods and beverages although four of the respondents supplemented their diet with a daily multi-vitamin and mineral tablet. Sports drinks were popular with most athletes particularly after training or competition.

All our athletes had difficulty finding information on sports nutrition. Those that were interested made special enquiries at the Sports Council, library and bookstores.

Discussion

Most athletes seemed aware that diet could affect their sports performance but were not yet sufficiently motivated or capable of making dietary changes. It is possible that this is due to the lack of information available combined with hectic schedules that do not allow for research into and practice of strict dietary regiments.

It is encouraging that most respondents have usual food choices and did not take any of the potentially dangerous formulations which are marketed to boost sports performance (1). Some athletes chose to take a daily multi-vitamin and mineral tablet and many consumed sports drinks particularly after sporting activity. Both practices are quite acceptable and may be beneficial to the individual but can be costly especially for school athletes (2, 3, 4).

Conclusion

Nutrition information for sportsmen and women in the west is becoming more readily available as leaflets and books on the subject are increasing in number. There are also many sports nutritionists and dietitians making their services available to groups and individuals at club and national level.

There is a gap in Singapore that only the dietitian can fill. Production of resources and simple practical advice tailored to the Singaporean athletes' lifestyle and eating habits may lead to greater success and achievement of competitors from all levels.

Nicola Gilbert is a registered Dietitian who was with National University Hospital until April 93. Nicky was a member of the SNDA Main Committee and has a special interest in sports nutrition.

The High Performance diet

Guidelines and tips to keep fit, healthy and maximize physical performance

Important nutrients

Energy

Energy for exercise comes from the glycogen stores in the muscle and liver which comes mainly from carbohydrate foods. Bergstrom et al in 1967 first demonstrated that a high carbohydrate diet was important to build up the glycogen stores and could increase exercise time to exhaustion by nearly 50% (5).

Carbohydrates

Starchy foods especially from unrefined sources are the ideal choice providing a steady energy supply and include rice, noodles, bread, cereals, pasta, potatoes and chappati. However these foods are bulky and it may be difficult for some to get sufficient energy from these foods and so some sugary foods may also be required (6).

Protein

Use of protein supplements or consumption of a high protein diet including large quantities of meat, eggs and dairy products is expensive and does not improve muscle mass or sporting performance (7).

It can also have permanent damaging effects on liver and kidney function (8).

Protein requirements may increase during strenuous exercise but can be adequately met by eating a high carbohydrate diet with moderate amounts of protein from vegetable and animal sources.

Fats

Body fat stores provide some fuel for exercise once glycogen stores are diminished. Eating excess fat will only lead to weight gain and does not improve performance.

Vitamin and mineral supplements do not improve performance and can be toxic in large quantity (2). Usually the RDA for most vitamins and minerals can be met by a healthy varied diet rich in wholegrain foods, fruit and vegetables. If dietary intake is restricted by training schedules or reducing diets a once daily multi-vitamin and mineral tablet is acceptable (9).

Calcium

Adequate calcium is important for developing maximal bone mass and keeping bones strong and healthy. Sportswomen require extra calcium if they are still growing or training hard. As dairy products are not popular with many Singaporeans, other sources of calcium such as soybean products, bony fish, green vegetables should be regularly consumed.

Iron

Women athletes, especially endurance athletes, vegetarians and those at low energy intakes may be at risk of developing a deficiency. Cereals, green vegetables and pulses taken with fruit juice as a source of vitamin C are useful when meat intakes are low. Supplements are not usually necessary.

In general, to ensure adequate nutrition:

1. Aim to eat regular meals and arrange training schedule accordingly.
2. Snacks are usually necessary to provide sufficient energy intake.
3. Make use of carbohydrate rich fluids if bulky foods are not appropriate.
4. Ensure adequate hydration by drinking plenty of water and dilute fruit juices throughout the day.

Healthy local food choices for athletes

Breakfasts

Porridge or rice with fish or meat or nuts or beans or taufoo and vegetables.

Soup or dry noodles without extra oil.

Wholemeal bread with a thin spread of margarine and jam or egg (boiled or poached) or low fat cheese.

Oats or other wholegrain cereals with low fat milk.

Chappati/thosai with dahls.
With fruit juices and/or fresh fruit.

Lunch and dinner

Rice (try brown occasionally) or noodles or wholemeal bread or thosai etc (cooked without oil).

With moderate portion of fish or skinless chicken (steamed, boiled, soup, lightly stir fried but not deep fried or oily).

With large portion of cooked vegetables or salad followed by fresh fruit.

Suitable snacks

Red/green bean soup	Cereal bars
Red bean pao	Sandwiches
Steamed popiah	Low fat yoghurts
Chinese rojak	Fresh and dried fruit
Soya bean curd	

Sugary snacks and confectionery may be appropriate to boost energy intake without bulk.

Suitable fluids

Water
Fruit juices
Low fat milk
Low fat yoghurt drinks
Isotonic sports drinks

Each athlete has unique requirements and therefore food and fluid choices are suited to training schedule and sporting activity

Approaching competition

Prior to competition high carbohydrate foods and fluids should be adequately consumed to ensure sufficient glycogen storage and hydration. Familiar foods only should be taken and alcohol avoided.

3 — 4 days before the event training should gradually be reduced and a high carbohydrate diet, mainly from unrefined sources, taken to prevent depletion of glycogen stores.

On competition day

Athletes should be competing with full energy stores but on an empty stomach and therefore should eat 3-4 hours before the event to allow digestion. This meal should be low in fat to promote rapid gastric emptying and rich in carbohydrate for energy.

Adequate fluid must be taken to ensure hydration.

Meal replacement powders made with skimmed milk are becoming a popular way of meeting both criteria (2).

Snacks immediately before the event are recommended only for endurance athletes (10).

During the event

Large fluid losses occur which can impair performance and heat loss (11).

90 — 120 mls of fluid every 15 — 20 minutes is usually well tolerated to maintain hydration. Hypo or isotonic drinks promote rapid absorption whereas sugary hypertonic solutions could cause much discomfort.

After the event

It is important to replenish the diminished glycogen stores. Refuelling should take place within 1 to 2 hours after exercise to ensure adequate storage of glycogen. Failure to do so so will lead to reduced stores and an impaired subsequent performance (12). Carbohydrate-rich snacks and fluids are the foods of choice and on this occasion glucose tablets and commercial sports drinks can provide a less bulky way of achieving adequate carbohydrate intake (2).

Sports nutrition is a relatively new subject with many controversies and much potential for research. Each athlete has individual needs and therefore the dietitian has much scope to use and develop his/her skills to help the Singaporean athlete to reach their sporting potential.

Acknowledgement

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References

1. Steroid alternatives, Phys. Sportsmed. 1992 20(3):189-98.
2. Lindeman, A.K., Eating for endurance or ultra-endurance. Phys and Sportsmed. 1992 20(3):87-104.
3. Eating well. Phys and Sportsmed. 1992, 20(3):11-12.
4. Sports drinks. Med Sci Sports Exerc. 1992 24(1):72-9
5. Bergstrom, J., L. Hermansen, L., Hultman, E., and Saltin, B. (1967). Diet, muscle glycogen and physical performance. Acta Physiol. Scand 71: 140-150.
6. Sherman, W.M. Costill, D.L., Fink, W., Miller, J. (1981). Effect of exercise-diet manipulation on muscle glycogen and its subsequent utilization during performance. Int. J. Sports Med 2:114-118.
7. Dohm, G.L. (1984). Protein nutrition for the athlete. In: Nutritional aspects of exercise. Clinics in Sports Medicine. Hecker, A.L., (Ed) pp 595-604, Saunders Co Philadelphia.
8. Bodybuilding, high protein diet and progressive renal failure in chronic glomerulonephritis. Lancet 1993. 341(8441):379-80.
9. Williams, M.H. (1984). Vitamin and mineral supplements to athletes. Do they help? In: Nutritional aspects of exercise. Clinics in Sports Medicine. Hecker, A.L. (Ed) pp 623-38. W.B. Saunders Co Phíladelphia.
10. Foster, C., Costill, D.L. and Fink, W.J. (1979). Effect of pre-exercise feeding on endurance performance. Med Sci Sports 11:1-5.
11. Maughan, R.J. (1986). Fluid and electrolyte balance. In: Proceedings of National Symposium on Nutrition in Sport. Ed: Shrimpton, D. and Berry, P., Ottaway Shaklee U.K. 17-23.
12. Pieh L.K. (1984). Time course for refilling glycogen stores after exercise induced glycogen depletion. Acta Physiol Scand. 90:297-302.

Position of The American Dietetic Association: Nutrition for physical fitness and athletic performance for adults[1]

Technical Support Paper

A proper, well-balanced diet is an essential component of any fitness or sports programme. As more persons assume responsibility for their own health and fitness and engage in a variety of sports and exercise programmes, it is essential that they have access to appropriate and accurate nutrition information. Those involved in more intense athletic activity require more specific information and education. This article addresses the needs of both groups and makes specific recommendations on how best to achieve their unique nutrition and fitness goals.

Taking personal responsibility for one's health is a major force behind the fitness movement. Participants in exercise programmes range from school-age children to adults of all ages, from elite competitors to weekend golfers. Although all of those persons consider themselves athletes, their interests, skills, and training needs are varied: competition, fun, improved fitness, and weight control. Messages from the marketplace on how best to achieve each of their unique nutrition and fitness goals can confuse the consumer.

Position

It is the position of The American Dietetic Association to support the need for accurate and appropriate nutrition education to promote optimum fitness and well-being. The American Dietetic Association also recognizes the need for more specific nutrition recommendations for those individuals involved in more intense athletic activity.

Beginning and maintaining good nutrition and exercise habits require learning and adopting proper behaviours and reinforcing adherence. New habits are more likely to be permanently incorporated into a life-style pattern if they gradually replace undesirable ones. Ideally, positive behaviour patterns should be learned in childhood as a strong basis for lifelong preventive health. Proper adult role models for children at home can reinforce health education cirriculums (including nutrition) from the schools. Physical education classes can emphasize athletic activities that are enjoyable throughout a lifetime and reinforce the benefits of participation.

The benefits of regular exercise and a nutritionally adequate diet are wide ranged. Lack of exercise and excessive intakes of energy, fat, cholesterol, sugar, sodium, and highly refined foods that are low in fibre are believed to increase the risk of developing a number of chronic diseases of Western society. Hence, early intervention is important as a preventive health measure. It is beyond the scope of this paper to discuss specific guidelines for the development of an exercise programme. However, resources are available for the practitioner, such as "The recommended quantity and quality of exercise for developing and maintaining fitness in healthy adults". (1)

The Dietary Guidelines for Americans (2), developed by the Departments of Agriculture and Health and Human Services, and the food groups published in 1979 by the Department of Agriculture in the booklet *Food* (3) are excellent tools for teaching diet- and menu-planning aimed at improving food selection and nutritional well-being. Except for calories, established dietary guidelines do not vary a great deal between the general public and the athlete.

Body composition/ideal weight

The importance of proper nutrition and exercise for weight control is well known. A 1985 National Institues of Health Consensus Development Conference on Obesity reported that an established health hazard exists for individuals who are more than 20% over their optimal weight. (4) Therefore, maintaining a desirable weight has health implications beyond cosmetic or athletic goals for all individuals.

Specific athletic events require different body types and weights for maximal performance. From the 95-lb gymnast to the 300-lb lineman, the quality or composition of body weight differs. Too great a percentage of body fat may hinder performance. Updated weight-for-height charts, such as the 1983 Metropolitan Height-Weight Tables (5) or others (6), and indexes such as the Body Mass Index (4) are used to determine growth status and ideal body weight ranges. The ranges, however, do not provide body composition information and are not appropriate for many athletes. For example, an athlete may be considered overweight from the weight/height charts but actually be very lean if body fat accounts for a small percentage of the total body weight. Conversely, an underweight person may be overfat.

Body fat levels for athletes generally range from 4% to 12% in men and 10% to 20% in women. Ideal body composition may vary according to the sport and particular team position or event in which the person performs. For the general population, values up to 15% for men and 25% for women are acceptable. (7) Generally, clinical obesity is indicated at greater than 25% and 30% body fat for men and women, respectively.

Body composition can be estimated indirectly by several methods, including anthropometric measurements, hydrostatic weighing (body density), multiple isotope dilution (total and extracellular water), and electrical impedance units (lean body mass).(8,9)

Approved by the House of Delegates on October 26, 1986, to be in effect until October 1991, unless it is reaffirmed or withdrawn as directed in the position development procedures of the House of Delegates. The American Dietetic Association authorizes republication of this position, in its entirety, provided full and proper credit is given.

Sets of skinfold measurements taken with calipers at specific body sites are among the most practical, accurate, reliable and cost-effective field measurements available to estimate body composition. The literature reflects many combinations of various sites without consensus to establish one standard. Multiple sites provide better correlations to body density than a single measurement, because of variation in fat distribution. Population specificity, including sex, age, race and somatotype, must be considered when chosing a regression equation for the evaluation of the skinfold measurements. Such measurements have low reliability for very lean and very obese individuals. They are most appropriate for initial assessments and for future comparisons using the individual as his/her own control. The skill of the practitioner and inter-tester variability should be accounted for in practice sessions. (10)

Hydrostatic (or underwater) weighing is considered by many to be the most standardized method, but it requires substantial training, equipment and subject compliance. Although the method serves well in research and clinical settings, it is not practical as a field testing tool.

The electrical impedance method has been proposed as an accurate, non-invasive method to estimate body fat. Lean body tissue has a greater electrolyte level and a lower electrical resistance than fat. Therefore, the lower the reading of impedance, the greater the lean body mass content of the individual. Two methods are available. One utilizes a total body electrical conductivity (TOBEC) chamber, the other a Bioelectrical Impedance Analyzer (BIA). At this time, results from those procedures are not as accurately reproducible as hydrostatic weighing or skinfold measurements. Day-to-day fluctuations in body water may have a significant effect on the results. (11)

Circumference or girth measurements at selected body sites can be used as an alternate method for estimating body fat or evaluating changes in fatness and require minimal training for accuracy. (10) A "body mass index" (BMI) can also be utilized. To calculate BMI, one divides the body weight in kilograms by the square of the height in meters. A value greater than 30 is considered an indicator of obesity. (4)

Ideal or competitive body weight and composition for athletes should be achieved during the off-season and maintained throughout the competitive season. Performance then would not be compromised by excessive weight changes or from the fatigue or dehydration resulting from an improper diet.

Energy

Energy requirements must be modified to adapt to changing needs, which are high during growth periods and decrease with advancing age. Energy needs are especially high in physically active, rapidly growing teenagers. The decreased energy needs that are physiologically associated with aging are often combined with life-style changes. Decreased physical activity, a loss of lean body mass, and increased food intake can result in a higher percentage of fat, a positive caloric balance, and a tendency towards obesity.

For all age groups, balancing energy expenditure with caloric intake is the most effective method for weight control and maintenance. The energy equivalents of different daily and athletic activities are available.(7) Energy demands are based on the intensity, duration, frequency and type of activity involved.

For achieving optimal weight, a programme of regularly performed aerobic exercise (20 to 30 minute sessions, at least three times a week), combined with a proper diet, is most effective in producing desirable changes in body composition. Aerobic exercise is any activity involving large muscle groups with oxygen utilized for energy production. When such exercise is combined with a calorically prudent diet, the body's muscle mass component can be increased while body fat stores are reduced. Initially, this process may result in a small increase in total body weight, but ultimately, the body fat loss will produce a net body weight loss. The daily caloric intake necessary to maintain weight will increase with a decreasing percent body fat as a result of an increase in both body mass and the body's metabolic rate. Although weight training can produce an increase in lean body mass, as an anaerobic activity that utilizes muscle glycogen stores for energy, it is not an effective programme for reducing body fat stores.

Individuals engaged in vigorous physical training programmes may have energy needs ranging from 3,000 to 6,000 kcal or more a day. (7) It can be difficult to consume such large quantities of food with the scheduling constraints of training, sleep, school, or work without a well-planned dietary programme.

Carbohydrate

Foods high in complex carbohydrates should be emphasised in the caloric distribution to promote glycogen storage. The recommended percentage of total calories derived from complex carbohydrates is 50% to 55% for the athlete, compared with 40% to 50% for the healthy American, with an additional 10% of the calories derived from simple sugars. (12) Athletes who train exhaustively on successive days or who compete in prolonged endurance events should follow a diet in which 65% to 70% of total calories are from carbohydrates. (13) Many athletes need help in planning a high-calorie, high-complex-carbohydrate diet, since such a diet requires consumption of a large quantity of food.

Carbohydrate loading

The procedure of classical carbohydrate loading was originally designed as a two-phase process; glycogen depletion followed by loading. A glycogen-depleted muscle becomes supersaturated in a proportional response to a high (500 to 600 gm) carbohydrate intake. (13) Increased glycogen stores enhance performance by providing a greater energy reserve upon which to draw during exhaustive competition, allowing maintenance of a high work intensity, not faster work, as shown in cyclists (14) and runners. (15) This practice is associated with side effects and risks. Repeated loading can cause depression, lethargy and loss of muscle tissue. Chest pains and abnormal electrocardiograms have also been reported with the classical method, possibly because of glycogen deposited in the cardiac muscle tissue. (16) Each extra gram of glycogen is stored with approximately 3 gm water, resulting in possible weight gain, stiffness, cramps, an overweight feeling and early fatigue.

It is now recommended that athletes follow a high-carbohydrate diet throughout training and begin a tapered rest approximately 7 days prior to the event, with complete rest the day before the event. The total

grams of carbohydrate intake is considered the key to loading, not the percentage from total calories. The goal for the majority of athletes is to increase the daily carbohydrate intake for the 7 days prior to competition, beginning at 350 gm and achieving 525 to 550 gm daily during the final 72 hours. (17) This difference is of special importance to the extremes of small and large athletes, for whom the equivalent carbohydrate percentage from total calories may be as high as 70% or as low as 40%. An athlete whose standard diet (60% to 65% carbohydrate) exceeds the absolute value of 550 gm because of a high caloric balance should continue to calculate his or her needs as a percentage of total caloric intake. It is recommended to achieve a diet providing either 60% to 65% complex carbohydrate or 550 gm carbohydrate, whichever is greater, to maximize muscle glycogen deposition during the 72 hours prior to competition.

This new approach increases muscle glycogen stores in a manner similar to that of the classical regimen but appears to be without serious side effects. It is important for both athletes and coaches to realize that maximizing muscle glycogen stores will be beneficial only to athletes participating in endurance events (more than 90 minutes) or multiple-event competitions and should be utilized only three to four times per year. Such a rigorous training and dietary programme may not be appropriate for school-age children or teens and should be discouraged for them. Athletes with diabetes or hypertriglyceridaemia should consult their physicians and/or dietitians before attempting such a dietary programme. (18)

Protein

The current Recommended Dietary Allowance (RDA) (19) of 0.8 gm protein per kilogram per day may not be sufficient for the active population. Studies suggest that during submaximal exercise, there is a net catabolism of body protein. During the initial phase of a training programme, previously sedentary young men have been shown to go through a period of net loss of body protein when consuming 1 gm/kg/day. (20,21) A recent study (22) reported that the current RDA may be inadequate for endurance athletes and suggested a protein requirement of 1 gm/kg/day. However, athletes eating a typical American diet consume in excess of 1 gm/kg/day and are not at risk for protein deficiency. (23)

When caloric intake is markedly reduced and energy needs are high, there may be a risk of an inadequate protein intake. This can be a problem for many young female athletes. (24,25) The need for additional dietary protein in strength and power athletes at various stages of training has not been defined. However, there is no evidence that very-high-protein diets (more than 2.0 to 2.5 gm/kg/day) commonly consumed by these athletes will help to increase muscle strength or protein content.

A diet providing 12% to 15% of calories from protein usually provides adequate protein when a minimum of 1,200 kcal is consumed by women and 1,500 kcal by men. Therefore, even though protein needs may be increased by physical activity, excessive protein consumption, either dietary or by liquid or powder supplementation, is not necessary. In fact, such practices can have deleterious effects, such as dehydration and renal complications. (26) A high-protein diet may be high in fat and calories and can contribute to the future development of obesity or cardiovascular disease. Athletes following vegetarian diets are not at any additional risk for protein deficiency if the combination of protein sources is complementary in regard to amino acid content.

Vitamins and minerals

Vitamins and minerals play an important role in the metabolism of nutrients, in oxidative reactions in the muscle, with oxygen transport system, and in muscular contraction. Physical activity increases the need for some vitamins and minerals, which the individual can easily meet by consuming a balanced diet. The RDA has been established as a guideline for nutrient needs for each age/sex category, with a wide margin of safety. Although a deficiency can impair physical performance, as well as cause many other deleterious effects, there is no conclusive evidence of performance enhancement with intakes of any single nutrient or nutrient combination in excess of the RDA.

Supplementation carries the risk that excessive blood vitamin levels will result in toxicity. Meeting the additional caloric demands of exercise by eating a variety of foods should ensure that the necessary vitamins, major minerals and trace minerals will be provided. Although some research has indicated increased needs for riboflavin from 0.6 mg/1,000 kcal (19) to 1.1 mg/1,000 kcal, (27) supplementation does not appear to improve maximum oxygen consumption. (28) Further research is needed in this area. Special consideration should be given to athletes who consume less than 1,000 kcal or whose stressful training and travelling schedules interrupt their nutrition programmes.

Consuming the RDA for iron and calcium is often difficult for many women without careful food selection. This may be because of a lower caloric intake, avoidance of many major dietary sources of iron and calcium because of their caloric and fat contents, and personal food preferences. Female athletes may experience those limitations in addition to the extra demand of their training programmes. They are often susceptible to iron-deficiency anaemia and may also be at risk for calcium loss from bones if they are amenorrhaeic.

Amenorrhaeic athletes may need additional calcium daily, possibly as much as 1,000 to 1,500 mg/day, for calcium balance to accommodate both their lower oestrogen levels and the decreased intestinal calcium absorption related to their prolonged training. A calcium supplement, such as calcium lactate, calcium gluconate, or calcium carbonate, each providing variable amounts of elemental calcium per tablet, may be necessary. Supplements are contraindicated in persons predisposed to kidney stones. Women with normal menses will benefit from the increased bone resorption of calcium associated with weight-bearing exercise and can, with proper food choices, meet their calcium needs without supplementation. (29)

Sports anaemia, a condition defined as the increased destruction of erythocytes and a transient drop in haemoglobin as a result of an acute stress response to exercise, (30) is both normocytic and normochromic. (31) While iron-deficiency anaemia is known to affect athletic performance, sports anaemia is associated with training and is not a "clinical" iron-deficiency anaemia. The cause of sports anaemia remains controversial; probably there are multiple causes, but marginal iron intakes may play a role in the development of sports anaemia. Exercise-induced factors implicated in the aetiology include haemolysis of erythrocytes; alterations in iron metabolism; including increased elimination and impaired absorption; haematuria; increased erythrocyte osmotic fragility, causing reduced red blood cell survival time; and a possible shift in the oxygen dissociation curve. (30)

It is recommended that individuals at risk for anaemia have periodic iron status evaluations, preferably testing ferritin levels. Haemoglobin levels may fluctuate but do not vary significantly until iron stores are negligible. All athletes should make only gradual changes in their training programmes, maintain body weight during the competitive season, and monitor their dietary intake carefully to ensure adequate iron intakes. If an individual's intake remains inadequate, a moderate iron supplement, providing the 18-mg RDA, is recommended, with continued monitoring to replace iron stores that may have diminshed as a result of training. (32)

Athletes may be at risk for developing iron deficiency because of sweat losses, (33) intestinal losses, (34) haematuria, (35) increased demands for increased total body haemoglobin, and poor dietary intakes. Studies of bone marrow storage have indicated low iron stores in athletes, (36,37) which lends support to a concern for iron status in both men and women. Although the exact requirement for iron for athletes has not been determined, it is reasonable to suggest that those engaged in strenuous actvity and competition should have heightened awareness of their iron status. However, ferritin levels should be checked before iron supplements are prescribed.

Hydration: Fluid, electrolyte and carbohydrate replacement

Proper hydration is essential for athletic performance. Dehydration can cause a reduction in maximal oxygen consumption and can compromise heat dissipation, which increases the body temperature and results in a loss of coordination. (26) Water loss via sweat, to the extent of a 5% reduction in body weight, can lead to cramps and heat exhaustion; extreme dehydration, denoted by an approximately 7% body weight loss, can cause hallucinations or life-threatening heat stroke. (38) Survivors of heat stroke are often susceptible to future heat injury.

Vigorous exercise may blunt the thirst mechanism, making it difficult to replace fluid loss without a plan for periodic consumption. Some individuals may lose as much as 2 to 4 l sweat (6 to 8 lb body weight) per hour during strenuous activity. (39-43) Body weight should be monitored pre- and post-exercise and again the following morning. For each pound lost from the pre-exercise body weight, 16 oz fluid should be consumed prior to the next exercise session. If weight has not returned to within 1 to 2 lb of the previous day's value, exercise should be temporarily moderated to avoid further dehydration, while increased fluid consumption is continued.

In addition to the fluid at the pre-competition/training meal, athletes should try to drink approximately 2 cups (16 to 20 oz) fluid about 2 hours before exertion. Another 2 c water should be taken approximately 15 to 20 minutes prior to endurance exercise. In heat stress environments, frequent small servings (4 to 6 oz every 10 to 15 minutes) of plain cool water (40° to 50°F or 5° to 10°C) are recommended throughout the event to avoid gastric distress. (44) Athletes should become accustomed to this amount of fluid during training sessions so that they do not experience discomfort during competition.

For most persons undertaking moderate exercise in moderate temperature conditions, the traditional fluid replacement of choice is plain cool water. (45) The typical American diet supplies ample sodium, chloride, potassium and magnesium to replace sweat losses in most cases. Heavy exercise and/or extreme environmental conditions, such as a high temperature-humidity index, may warrant an electrolyte replacement as part of the hydration process. A number of commercial sport beverages are available to help replace electrolytes and supply energy to replace muscle glycogen stores. The composition of each beverage should be reviewed, as it may be necessary to dilute the solution with plain water to achieve the proper osmolarity. Replacement solutions are reported to have their greatest benefit during events lasting 60 minutes or more. (46)

The body is well equipped to conserve both fluids and electrolytes at times of stress. The sweat glands and kidneys conserve electrolytes to minimize their losses when adapting to the heat. Therefore, the degree of acclamatization, the fitness level, and the specific environmental conditions must be considered when recommending a hydration regimen. Care should also be taken to prevent low plasma sodium concentrations (hyponatraemia). When plain water is consumed in large quantities during ultramarathons or triathalons, the resulting dilution can cause diarrhoea, exhaustion, syncope, pulmonary oedema and EKG disturbances. (40)

To date, effective carbohydrate feeding during or prior to exertion is controversial. The time of ingestion and the duration of exercise are critical variables. Ingestion of a beverage containing 75 gm carbohydrate per 300 ml 30 to 45 minutes prior to exertion can result in a hypoglycemic reaction with a premature onset of fatigue. (47) Fructose does not appear to cause significant hypoglycemia and may spare glycogen during the early stages of sub-maximal exercise, but moderate intakes often cause gastric distress. (48) A carbohydrate feeding during prolonged exercise tends to maintain blood glucose levels and spares muscle glycogen, the limiting factor leading to fatigue. (49) While this may be of benefit to athletes in endurance competition (60 minutes or longer), care should be taken not to exceed a 10% sugar concentration so that gastric emptying and essential fluid replacement are not limited. (50)

Recently, glucose polymers in powder and liquid form have received attention as energy replacements that may overcome the limitations of glucose solutions for endurance athletes. (51) Those fluid replacement solutions provide carbohydrate in the form of glucose polymers as an energy source and replenish electrolytes for continued muscular exertion without delaying gastric emptying. Though initial findings are promising, further study is necessary to determine the efficacy of the polymers and to establish recommendations.

In the appropriate endurance activities, such as triathalons, marathons, or ultramarathons, or in sporting events involving multiple heats or competitions throughout the day, carbohydrate and electrolyte

beverages appear to enhance performance. Research and field testing are necessary to determine which combination and concentrations of electrolytes and carbohydrates allow for optimal gastric emptying and intestinal absorption. For moderate exercise, without extreme conditions of environment or duration, cool water remains the recommended fluid.

Ergogenic aids

Ergogenic aids are reputed to enhance performance above the levels anticipated under normal conditions. In many events in which the difference between winning and losing is split seconds, it is not surprising that athletes are susceptible to claims for magical foods or nutrients. Virtually every food has at some time been promoted as an ergogenic aid. The most popular aids include bee pollen, brewer's yeast, wheat germ and wheat germ oil, honey, lecithin, amino acids, vitamins D and E, ascorbic acid, kelp and gelatin. Research to support athletes' anecdotal evidence of performance enhancers is scanty.

In most cases, "performance enhancers" are simply more expensive forms of protein, sugars, or vitamins. However, when athletes are convinced that certain foods, dietary regimens, or supplements improve performance, those substances or techniques may provide psychological rather than proven physiological benefits. It is when those practices replace a sound nutriton programme, health and performance may be compromised, resulting in serious consequences.

Alcohol

Alcohol has been shown to have no beneficial influence on oxygen consumption, energy metabolism, or cardiac output. Acute negative effects include diuresis and impairment of both psychomotor coordination and body temperature regulation in cold environments. It may also be responsible for decreased muscular strength, power and endurance and may interfere with oxygen utilization and transport. (52) Alcohol is the most commonly abused drug in the United States. Its use is associated with all types of accidents and is implicated in several pathological conditions, such as liver damage, cardiomyopathy, and generalized skeletal myopathy. (53) Alcohol is not recommended for athletes.

Caffeine

Caffeine's ability to mobilize plasma free fatty acids is theorized to have a glycogen-sparing action during exercise that may offset fatigue. (54) Caffeine may also have an effect on neuronal excitability, which would enhance recruitment of motor units. (55) The amount of caffeine necessary to initiate these actions is still not known, although individual variability will affect results. The literature suggests that an intake of 4 to 5 mg per kilogram of body weight (2 cups of coffee [300 mg] for a 70 kg person) results in a significant plasma caffeine level within 15 minutes. (56) High intakes may result in fluid loss, polyuria, increased heart rate, and an increased anxiety level that may outweigh any positive effects on fuel utilization or alertness. The United States Olympic Committee considers caffeine to be a drug and does not sanction its use by athletes. The pertinent research has been discussed, but the use of caffeine by athletes as an ergogenic aid cannot be condoned.

Pre-competition meal

What an athlete eats before competition does make a difference, both physically and psychologically. The pre-event meal should be pleasant and satisfying to prevent hunger during the competition. The meal should be eaten 3½ to 4 hours prior to competition to ensure gastric emptying and avoid discomfort or cramping. The meal may range from 300 to 1,000 calories, but generally the lighter, the better. Food choices should be primarily complex carbohydrates — breads, cereals, fruits and vegetables — and not fats and large portions of fatty proteins that take longer to digest. Commercially available beverage meals may be acceptable alternatives for athletes who experience gastric discomfort because of pre-competition anxiety or when scheduling does not allow sufficient time for the proper digestion of whole foods. Such beverages are satisfying, provide calories, pass through the stomach quickly and may be consumed an hour before exertion.

Two to three cups of fluid should be included with the meal, with continued fluid intake up until the event. Eating a candy bar or other sugar source for a quick energy boost is a common practice based on myth. The high fat content of the candy bar slows the rate of digestion, and the quickly assimilated sugar may cause an insulin overshoot, producing an adverse reaction. (57) This practice can lead to a hypoglycemic state, causing premature fatigue and decreased performance, and should be avoided.

The most important factor of the pre-event meal is the athlete's comfort. It is a poor time to experiment with new foods or eating patterns. A sudden increase in complex carbohydrate or fibre intake can result in increased gastrointestinal motility and discomfort, exaggerated by "pre-competition nerves," interfering with the athlete's concentration. The athlete's diet should be considered an integral component of the total training regimen. Last minute changes or manipulations are risky. A well-planned, balanced programme is the basis for good health and enhanced athletic performance.

References

1. American College of Sports Medicine: Position statement: The Recommended quantity and quality of exercise for developing and maintaining fitness in healthy adults. Med Sci Sports 10(3):vii. 1978.
2. Nutrition and Your Health. Dietary Guidelines for Americans. Washington, DE: U.S. Departments of Agriculture and Health and Human Services, 1980.
3 Food, USDA Home and Garden Bulletin No. 228, 1979.
4 Consensus Panel addresses obesity question. JAMA 254:1879, 1988.
5 1983 Metropolitan height and weight tables. Stat Bull Metrop insur Co 64:3 (Jan-June), 1983.
6 Weigley, E.S.: Average? Ideal? Desirable? A brief overview of height-weight tables in the United States. J Am Diet Assoc 84:417, 1984.
7 Katch, F.I., and, McArdle, W.D.: Nutrition, Weight Control and Exercise. Philadelphia: Lea & Febiger, 1983.
8 Keys, A., and Grande, F.: Body weight, body composition and calorie status. In Goodhart, R.S., and Shils, M.E., eds.: Modern Nutrition in Health and Disease, 6th ed. Philadelphia: Lea & Febiger, 1981.
9 Pike, R.L., and Brown, M.L.: Nutrition: An Integrated Approach. 3rd ed. New York: John Wiley & Sons, 1984.
10 Katch, F.I, and McArdle, W.D.: Prediction of body density from simply anthropometric measurements in college men and women. Human Biol 45:445, 1973.
11 Nsh, H.L.; Body fat measurement: Weighing the pros and cons of electrical impedance. Phys Sports Med 13(1):124, 1985.
12 United States Senate Select Committee on Nutrition and Human Needs. Dietary Goals for the United States. 2nd ed. Washington, DC: Government Printing Office, 1977.
13 Sherman, W.: Carbohydrates, muscle glycogen and muscle glycogen super-compensation, In Williams, M.H., ed.: Ergogenic Aids in Sports. Champaign, IL: Human Kinetic Publishers 3, 1983.
14 Hultamn, E.: Studies on muscle metabolism of glycogen and active phosphate in man with special reference to exercise and diet. Scand J Clin lab invest 19:94 (Suppl.), 1967.
15 Costill, D.L.; Sherman, W.M., Fink, W.J.; Maresh, C.; Witten, M., and Miller, J.N.: The role of dietary carbohydrate in muscle glycogen resynthesis after strenuous running. Am J Clin Ntr 34:1831, 1981.
16 Stamford, B.: Does carbohydrate loading work? Phys Sports Med (12) 9:196, 1984.
17 Sherman, W.M., Costill, D.L., Fink, W.J., and Miller, J.N.: The effect of exercise and diet manipulation of muscle glycogen and its subsequent utilisation during performance. Int J Sports Med 2:114, 1981.
18 Forgac, M.T.: Carbohydrate loading — a review. J Am Diet Assoc 75:42, 1979.
19 Food and Nutrition Board: Recommended Dietary Allowances. 9th rev ed., 1980. Washington, DC: National Academy of Sciences. 1980.
20 Gontzea, I., Sutzescw, P., and Domitrache, S.: The influence of muscular activity on nitrogen balance and the need of man for proteins. Nutr Rep Int 10:35, 1974.
21 Gontzea, I., Sutzescw, P., and Domitrache, S.: The influence of adaptation to physical effort on nitrogen balance in man Nutr Rep Int 11:233, 1971.
22 Zackin, M.S., Meredith, C.N., Frontera, W.R. and Evans, W.J.: The effect of chronic exercise on protein requirements in middle-aged man. Abstract for the Sixth International Symposium on the Biochemistry of Exercise, 1985.
23 Short, S.H., and Short, W.R.: Four-year study of university athletes' dietary intake, J Am Diet Assoc 82:632, 1983.
24 Nelson, M.E., Fisher, E.C., Evans, W.J., Zackin, M.S., and Tuksoy, R.N.: The effect of amenorrhoea and diet on bone mineral density in young, highly trained women. Abstract for the Sixth International Symposium on the Biochemistry of Exercise, 1985.
25 Stein, R.P., Schulter, M.D., and Dramond, C.E.: Nutrition, protein turnover, and physical activity in young women. Am J Clin Nutr 38:233, 1983.
26 Ahlman, V., and Karoven, M.: Weight reduction by sweating in wrestlers and its effect on physical fitness. J Sports Med Phys Fit 1:58, 1962.
27 Belko, A.Z., Kalward, H.J., Rotter, M.A., Bogrizz, S., Miller, D., Hass, J.D., and Roe, D.A.:The effects of exercise on riboflavin requirements of young women. Am J Clin Nutr 37:504, 1983.
28. Belko, M., Kalward, H.J., Obarzanek, E., Weinberg, S., Roach, R., McKeon, G., and Roe, D.A.: Effects of exercise on riboflavin requirements: Biological validation in weight reducing women, Am J Clin Nutr 41:270, 1985.
29 Heaney, R.P.: Nutritional factors and estrogen in age-related bone loss. Clin Invest Med 5:147, 1982.
30 Clementi, D.B., and Sawchuk, L.L.: Iron status and sports performance. Sports Med 1:65, 1984.
31. Buskirk, E.R.: Some nutritional considerations in the conditioning of athletes. Ann Rev Nutr 1:319, 1981.
32 Shangold, M., and Mirkin, G.: The Complete Sports Medicine Book for Women. New York: Simon and Schuster, 1985.
33 Paulev, P.E., Jordal, R., and Strandberg Pederson, N.: Dermal excretion of iron in intensely training athletes. Clin Chem Acta 127:19, 1983.
30 Clementi, D.B., and Sawchuk, L.L.: Iron status and sports performance. Sports Med 1:65, 1984.
31. Buskirk, E.R.: Some nutritional considerations in the conditioning of athletes. Ann Rev Nutr 1:319, 1981.
32 Shangold, M., and Mirkin, G.: The Complete Sports Medicine Book for Women. New York: Simon and Schuster, 1985.
33 Paulev, P.E., Jordal, R., and Strandberg Pederson, N.: Dermal excretion of iron in intensely training athletes. Clin Chem Acta 127:19, 1983.
34 Stewart, J.G., Ahquist, D.A., McGill, D.B., Ilstrup, D.M., Schwartz, S., and Owen, R.A.: Gastrointestinal blood loss and anaemia in runners. Ann Intern Med 100:843, 1984.
35 Siegel, A.J., Hennekens, C.H., Soloman, H.S., and Van Boeckel, B.: Exercise-related haematuria: Findings in a group of marathon runners. JAMA 241:391, 1979.
36. Wishnitzer, R.; Vorst, E., and Berrebi, A.: Bone marrow iron depression in competitive distance runners. Int J Sports Med 4:27, 1983.
37 Magnusson, B.; Hallberg, L., Rossander, L.; and Swolin, B.: Iron metabolism and "sports anemia". In: Hermatological comparison of elite runners and control subjects. Acta Med Scand 216:157, 1984.
38 Commission on Nutritional Misinformation, Food and Nutrition Board: Water deprivation and performance of athletes. Nutr Rec 32:314, 1974.
39 Bergstrom, J., and Hultman, E.: Nutrition for maximal sports performance. JAMA 221:999, 1972.
40 Nokes, T.D.; Goodwin, N., Rayner, B.L., Brankan, T., and Taylor, R.K.W.: Water intoxication: A possible complication during endurance exercise.

Med Sci Sports Exer 17(3):370, 1985.

41 American College of Sports Medicine: Position Statement: Prevention of thermal injuries during distance running. Indianpolis, In: American College of Sports Medicine, 1985.

42 Costill, D.L.: Physiology of marathon running. JAMA 221:1024, 1972.

43 Williams, M.H.: Nutritional Aspects of Human Physical and Athletic Performance. Springfield, IL: Charles C Thomas, 1976.

44 Sports Nutrition: A Guide for the Professional Working with Active People. Chicago: American Dietetic Association, 1986.

45 Costill, D.L., and Saltin, B.: Factors limiting gastric emptying during rest and exercise. J Appl Physiol 37:679, 1974.

46 Placido, V.J., Macaraeg, J.R., and Santos, C.A.: The Effect of Glucose Polymer-Electrolyte Solution on Exercise Duration. Proceedings of Australian Sports Medicine Federation: Medical and Scientific Aspects of Elitism in Sport and Science. Vol. 8, 1984.

47 Foster, C., Costill, D.L., and Fink, W.J.: Effects of pre-exercise feedings on endurance performance. Med Sci Sports 11(1):1, 1979.

48 American College of Sports Medicine. Position statement: Prevention of heat injuries during distance running. Med Sci Sports 1:vii, 1975.

49 Coyle, E.F., Hagberg, J.M., Hurley, B.F., Martin, W.H., Ehsani, A.A., and Holloszy, J.O.: Carbohydrate feeding during prolonged strenuous exercise can delay fatigue. J Appl Physiol 55:230, 1983.

50 Lamb, D.R.,and Brodowicz, G.R.: Optimal use of fluids of varying formulations to minimize exercise-induced disturbances in homeostasis. Sports Med 3:247, 1986.

51 Fox, E.L., ed.: Ross Symposium on Nutrient Utilization During Exercise. Columbus, OH: Ross Laboratories, 1983.

52 American College of Sports Medicine: Position statement: Use of alcohol by sports participants. Med Sci Sports Exer 14(6):ix, 1982.

53 Position Statement on the Use of Alcohol in Sports. Indianpolis, In: American College of Sports Medicine, 1982.

54 Slavin, J.L.; and Joensen, D.J.: Caffeine and sports performance. Phys Sports Med 13:191, 1985.

55 Ivy, J.L., Costill, D.L., Fink, W.J., and Lower, R.W.: Influence of caffeine and carbohydrate feedings on endurance performance. Med Sci Sports 11(1):6, 2979.

56 Essig, D., Costill, D.L., and VanHandel, P.J.: Effects of caffeine ingestion on utilization of muscle glycogen and lipids during leg ergometer cycling. Int J Sports Med 1:86, 1980.

57 Hargreaves, M., Costil, D.L., Coggan, A., Fink, W.K., and Nishibata, I: Effect of carbohydrate feedings on muscle glycogen. Med Sci Sports Exer 16(3):219, 1984.

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Singapore Nutrition and Dietetics Association Annual Report 1992 — '93

The Year in Review

The Association has enjoyed a busy and rewarding year. The ten-year National Health Campaign has seen the Association being actively involved with many health promotion programmes. The Association continues to grow in its memberships and activities. The Association's recommendation to the National Diabetes Commission is being incorporated into the National Guidelines for Diabetes Care. The Continuing Education Scheme has seen 16 full members successfully qualify for the Certificate in 1992. The bi-annual SNDA Journals are circulated to the most updated list of medical practitioners and with much positive feed-back. The Association will be planning for its 10th Anniversary celebration with a scientific seminar in 1994.

The 1992-93 Central Committee

The Committee was elected to office at the 9th Annual General Meeting on May 30, 1992. Committee members elected were:

President	: Mrs Yeong Boon Yee
Vice President	: Mrs Lynn Alexander
Hon. Secretary	: Mrs Sue Hixson
Hon. Treasurer	: Ms Nicola Gilbert
Committee Members	: Mrs Tan Wei Ling
	Ms Germaine Heng
	Ms Annie Ling
	Ms Lisa Choi
	Ms Diana Peers
	Ms Margaret Hays
	Ms Karen Tan

Resignation of Ms Karen Tan was received and accepted with regret at the 3rd committee meeting. A total of 11 main committee meetings were held.

Membership

The membership of the Association grew by 11% since the previous year. Of the total membership of 119, 56 are full members of which 49 are currently residing in Singapore. The committee, due to a possible revision of the constitution, has kept on-hold the applications for new affiliate membership during the last three months of the fiscal year.

Category	88/89	89/90	90/91	91/92	92/93
Full	34	36	48	52	56
Affiliate	23	59	51	55	63
Honorary	—	—	—	—	—
Total	57	95	99	107	119

Professional/Academic Meetings

A total of five nutrition related talks were presented in three professional and academic meetings this year. Twin presentations were planned wherever possible to maximize the time and effort of the committee and for the convenience of members.

30.9.92 - "Role of the Dietitian in a Marketing Department — Response of the Australian Meat Industry to Changing Nutrition Issues" — by Margaret Hays

"Dietary Strategies for Physical Performance — Highlights of the Scientific Tour of the 1992 Olympics, Barcelona, Spain" — Mrs Tan Wei Ling

Accredited for 1 CE point.

31.11.92 - "Rationale For Infant Feeding Guidelines" — Professor David L. Yeung. Sponsored by Heinz.

Accredited for 1 CE point.

25.2.93 - "Salmonella in Children" — Professor Quak Seng Hock.

"Nutrition Education In Primary Care: Priorities, Current Practices And The Need for Further Education" — Ms Toh Hui Keng.

Accredited for 1 CE point.

National Health Fair

SNDA participated actively at the National Health Fair which was held in April and May of 1992. The Association took up a booth to create greater awareness of our profession and promote qualified dietitians and nutritionists as the expert nutrition educators. A "Nutrition Tips For Teens" pamphlet and a listing of available dietetic practices in Singapore were produced by the Association, together with an update of the Association brochure "Promoting Health Through Good Nutrition"

A total of 500,000 visitors visited this very successful event where Nutrition and Physical Fitness were a major theme. To further support the national campaign on healthy lifestyle, SNDA undertook the project of producing a recorded nutrition message and a manned Nutrition hot-line, "Nutri-link". In the latter, members answered queries on diet-related questions from the public.

National Foundation for Digestive Disease

The Association was invited to participate at the scientific programme and exhibition for NFSS Day on July 26, 1992. Ms Germaine Heng manned the display and Ms Magdaline Cheong spoke on the dietary aspects of fibre and cancer of the large intestines. SNDA also put up a booth to display the fibre content of foods.

Scientific Seminars of the 1992 Olympics, Barcelona, Spain

SNDA was invited to nominate a representative to attend scientific seminar sponsored by Effem Foods on August 4, 1992 in conjunction with the Barcelona Olympics. Mrs Tan Wei Ling was nominated to represent the Association. The programme included meetings with scientists involved in sports and nutrition research. A brief review and update was given by Mrs Tan to members upon her return.

Continuing Education (CE)

This year saw the pioneering effort of the CE Committee coming to fruit. Committee members, comprising of Diana Peers, Nancy Evans, Leslie Walters and Letchumi Meyappan worked hard in organising meetings, validating and assisting eligible members obtain their CE Certificate through the Singapore Professional Centre (SPC). A total of 16 full members qualified for and received their CE Certificate at the beginning of 1993, enabling them to use the designation of RDS. A similar scheme for the Nutritionists who participate in the continuing education programme and qualify for CE Certification to use the designation of RNutrS has been proposed.

The SPC has informed the committee that the processing fee for certification has now been increased to S$30 effective Oct 1992. Hence, subsequent validation and award of CE certificate will be S$35, inclusive of the $5 levied by SNDA.

All full members are encouraged to participate in the CE programme as it provides the support and recognition that we seek for the Association, and to help members in preparation for possible future state registration of our profession.

Singapore Professional Centre

The Association had a presence in the Career '93 exhibition with display of our logo on a panel and distribution of the Association's brochure. We shared a combined booth with 29 other SPC member Associations that did not participate in taking up a full booth.

National Diabetes Commission

The National Diabetes Commission was appointed by the Ministry of Health in 1992 to provide expert advice on diabetes management and evaluate the national diabetes control programme. The SNDA was represented on the Commission by the Vice-President, Mrs Lynn Alexander.

The Commission formulated a draft report entitled "Guidelines for the Management of Diabetes Mellitus in Singapore" which was discussed at a consensus workshop on 13 February 1993. The report is currently undergoing final amendment before being published.

During the Commission's deliberations, SNDA stressed the importance of the dietitian in the diabetes health care team, and recommended that more dietitians be trained and employed. An abstract of our 1988 "Position Statement on Dietary Management of Individuals with Diabetes Mellitus" was included in the Commission's draft report, with the full position paper appended.

Dietetic Training/Accreditation

The sub-committee chaired by Carol Begin has gathered information and discussed the background and follow-up on the upgrading of the dietetic profession's status level within the Ministry. The possible setting up of a training course in Dietetics at diploma level being considered by the Ministry formed part of the objectives of drawing up guidelines and recommendations by the Association for the consideration by the government. The sub-committee will be maintained to finalize the draft recommendation.

FND/MOH Joint Workshop on "Promoting Healthy Eating in Hospitals"

Due to difficulties in co-ordinating the workshop as a joint event, the Ministry of Health will undertake the task of setting up the guidelines with input from hospital dietitians and catering personnel at a discussion session. One representative from SNDA will be invited to participate.

15th International Congress of Nutrition (ICN)

Request by SNDA for sponsorship of members to attend the congress was not very positive as many companies opted to sponsor participants directly. Bristol-Myers Squibb will be sponsoring one committee member and the Association will be offering two partial sponsorships to cover registration cost. The three will share with other fellow SNDA members their experiences and update on topics of interests upon their return.

The Singapore Journal of Nutrition and Dietetics

Two issues of the journal were published featuring health promotion in Singapore and child nutrition. Our current circulation is 2500 copies per issue. We are currently reaching all local Doctors through the updated SMA mailing list. This has lowered our cost and man-power requirements. We are grateful to Friesland Frico-Domo for sponsoring the mailing of the June '92 and Dec '92 issues.

The cost of printing has gone up and we need to have more nutritional and food companies support our journal by taking up advertisements in it. We also require the ideas and input from our members to make a truly dynamic journal that represents our profession in Singapore.

Toa Payoh Hospital has purchased 266 back issues and Wyeth has bought 40 back issues.

Amendments to the Constitution

Draft amendments to the Association's constitution is being proposed by the committee for members discussion and consideration at the AGM. The amendments seek to provide a better framework for the Association to continue serving its members and in protecting and furthering our profession.

Programmes for 1993-94

International Sports Science Conference, June 9-11, '93

Representatives from SNDA have been invited to take part in the Sports Nutrition Seminar and workshop "Nutrition Perspectives in Optimizing Sports Performance" to provide our expertise in the workshop. The conference and the one day seminar is jointly organized by the Singapore Sports Council and the International Life Sciences Institute (ILSI) Southeast Asia.

National Health Campaign on Cardiovascular Diseases and Hypertension, Sept-Oct 1993

In support of the National Health Campaign this year, the Association will take part and work with other organizations to promote nutrition education on the campaign theme.

International Conference on Ageing, Sept, 1993

The International Federation on Ageing and SAGE will be organizing an international conference on ageing. Further details are to be given.

Proposed CE Talks for Members

A talk on Writing for Media and Handling Media — Ms Lee Geok Boey

A talk on Nutritional Aspects of Cancer — Ms Lynn Alexander and An Oncologist.

Presentations on 15th ICN by sponsored SNDA members.

SNDA 10th Anniversary

A scientific seminar-conference to celebrate the occasion will be planned for 1994. The theme and time will be set by the new committee. Other professional organizations such as the SMA or SIFST may be invited to collaborate to broaden the scope of the conference.

Acknowledgements

The Association wishes to thank and recognize the dedicated members from the central committee and sub-committees who have been generous in volunteering their time and expertise to further the Association's goals and objectives. The central committee would also like to record its appreciation to all members and food related industries who have, in one way or another rendered their invaluable support and assistance to the success of the Association's activities.

It is indeed a privilege for me to be entrusted with the responsibility of leading the Association this past year. My heartfelt appreciation must go to the wonderful team with whom I had a fun time working, making it a most memorable and meaningful year for me. As we have come through the "teething years" and "growing pains" in gaining recognition for our profession and the Association, we can say with pride that the collective effort of our members during these ten years have not been wasted. I would like to call upon all members to come forward and further share the effort and responsibility as the Association looks towards a busy year ahead to carry us into a new decade of growth.

Yeong Boon Yee
President, SNDA, 1992-1993

MEETINGS

9 — 11 June 1993

International Sports Science Conference
Special feature: Nutrition Perspectives in Optimising Fitness and Sports Performance (June 10, 1993).

Venue:
Raffles City Convention Centre. The Westin Stamford Hotel and Westin Plaza.

Contact:
Dr K.C. Teh, Organizing Secretary, c/o Singapore Sports Council, National Stadium, Kallang, Singapore 1439.
Tel: 340-9680, Fax: 340-9537

22 — 24 September 1993

First International Food Data Base Conference

Venue:
Sydney, Australia

Contact:
Heather Greenfield, Dept of Food Science and Technology, University of New South Wales, P.O.Box 1, Kensington, NSW 2033, Australia.

26 September — 1 October 1993

International Congress of Nutrition — Nutrition in a Sustainable Environment.

Venue:
Adelaide, Australia

Contact:
Secretariat, CSIRO Division of Human Nutrition, P.O.Box 10041, Gouger St, Adelaide, SA 5000, Australia.

2 — 3 October 1993

2nd Intercontinental Multidisciplinary Conference on Food Choice

Venue:
Adelaide, Australia

Contact:
Dr Tony Worsley, CSIRO Division of Human Nutrition, P.O.Box 10041, Gouger St, Adelaide, SA 5000, Australia.

18 — 20 November 1993

Towards a Better Environment, Ecology Conscious Conduct in the Hotel and Food Service Industry

Venue:
Basel, Switzerland

Contact:
Alice Arnold, Foodservice Consultants Society International Europe, SV-Service, POB, CH-8032 Zurich, Switzerland.
Tel: 41-1-3855273, Fax: 41-1-3855436

Salmonella Gastroenteritis

by Dr S.H. Quak MBBS, M Med (Paediatrics), FAMS.

Introduction

Acute gastroenteritis (GE) is common in children. During infancy, most children would have experienced one or more episodes of diarrhoeal diseases. According to the World Health Organisation, about four to five million children below 5 years of age die from diarrhoeal diseases annually. (1) In Singapore, mortality in children due to GE had been decreasing over the years. (2). However, it is still one of the most common childhood diseases and it accounted for some 10% of hospital admissions in a general paediatric unit. (3)

Most of the cases of acute GE are due to an infection of the gastrointestinal tract. The aetiological agents can broadly be divided into two groups, i.e. viral or bacterial. Of course, less common infective agents such as parasites are possible but this is unusual in Singapore. Among the viral agents, rotavirus is one often encountered.

The bacteria responsible for acute GE in children has changed over the years. E coli which was common in 1960's and 1970's, is rarely encountered nowadays. Instead, Salmonella has become the common bacterial agent responsible for acute GE amongst hospitalised patients. (2,3) The reason for this observation is not clear.

Salmonella Species

The bacteria are gram-negative motile organisms. They have been subdivided into many different serotypes according to the somatic (O) and flagellar (H) antigens.

Infection is often transmitted via direct ingestion of infected food substances. Poultry, milk, eggs and shellfish are known to carry the germs. (4) Household pets such as dogs, cats and turtles can excrete the bacteria. (5) The human carrier rate is estimated at 2 to 50 per 100, and according to various studies 15% to 63% of epidemics is caused by human carriers. In Singapore, salmonella associated outbreaks of food poisoning have been reported. The vehicles of transmission include coconut jelly and "nasi lemak". (6) Various species of salmonella have been isolated. (6,7) Infections caused by salmonella typhimurium are the most common in children under 5 years of age. (7)

Pathophysiology

The acidic secretion of the stomach is one of the mechanisms for overcoming the infection of the gastrointestinal tract. A significant number of organisms must be ingested before an infection of the intestine can occur.

In children and infants, a salmonella infection of the intestine can produce a watery type of diarrhoea, resembling cholera. This is due to the toxin produced by the bacteria. The toxin acts on the enterocytes, particularly of the distal ileum, resulting in the active secretion of water and salt into the intestinal lumen. (8) Even if the patient is not eating or drinking, watery stools persist. This is characteristic of secretory diarrhoea.

The organisms invade the mucosa and are phagocytose in the lamina propria. Under such circumstances, there is ulceration of the mucosa and distortion of the villi. The ileum and caecum are commonly involved. Because of the tissue invasion, bacteraemia can occur, resulting in septicaemia and the infection of other organs causing meningitis and osteomyelitis. At the same time, the stools are bloody and often full of mucous.

Clinical features

The incubation period is about 12 to 72 hours. Fever, abdominal pain, vomiting and diarrhoea are often present. The clinical presentations are not different from those of other infections of the gastrointestinal tract. The stools may be watery, particularly for those species which induce a secretory diarrhoea. Blood and mucous are usually present and have an offensive "rotten-egg" odour. There are various grades of severity of the diarrhoea. In some patients, the clinical signs and symptoms are mild, lasting for a short period of time. However, diarrhoea may be prolonged in some cases, lasting for as long as 2-3 weeks. The stool frequency ranges from a couple of times a day to as many as 20 times in 24 hours.

The main complication is dehydration. Because of the excessive loss of water and electrolytes from the vomitus and stools, the affected patients can become severely dehydrated with other metabolic derangements occur in a short time. The resulting shock and hypotension may result in renal shut-down, brain damage and death. The other main complication is poor nutrition. Often, there is intense nausea with a reduction in food intake. This is particularly problematic among those children who are malnourished to start with. Dietary rehabilitation is an important aspect in the management of these children.

Management

Prevention is important in the management of acute GE. Public health factors such as a clean and safe water supply, personal hygiene and education of the parents in milk preparation play an essential role in diarrhoea prevention. Proper handling and refrigeration of food should not be neglected. Breastfeeding should be actively promoted. Breast milk is protective against gastrointestinal infection because it is unlikely to be contaminated by bacteria and because of its anti-infective properties.

The main aim of management is to prevent and treat any complication. As dehydration is common, no effort should be spared to prevent its occurrence. Affected children should be encouraged to drink fluids regularly. There is no need to stop the patient from taking food, including milk. Chung studied six subjects with infantile diarrhoea on normal and reduced food intake. (9) It was found that the absorption of each food ingredient was better in those with normal food intake, even though the faecal loss increased. In another study of 115 patients with infantile diarrhoea, those who were fed had a more prompt and consistent weight gain inspite of the larger volume of stools compared with those who underwent therapeutic oral starvation. Our own experience is similar to that of Chung. In a study consisting of four oral refeeding regimes following acute gastroenteritis, (10) it was found that those who were fed on full strength milk formula experienced better weight gain.

One of the useful ways of assessing hydration is monitoring the urine output. Any child with GE should be treated as if dehydrated and the urine output carefully checked. Early signs of dehydration include irritability and decreased urine output. There are a number of oral rehydration solutions available in Singapore and these are commonly prescribed by doctors for management of diarrhoea. However, home-made remedies such as rice water are just as effective. (11) Currently rice-based electrolytes are being marketed and have been found to be superior to glucose-electrolyte solutions in reducing the frequency and volume of stool output and in promoting weight gain. (12)

It is not necessary to use medicine to stop the diarrhoea. Diarrhoea is a physiological process whereby the intestine can get rid of its "harmful" and "unwanted" contents. Most of the antidiarrhoeal agents are anti-spasmodics or absorbents. They do not alter the clinical course of the infection or decrease the amount of salt and water lost in the stools. In fact, by decreasing the intestinal motility, there is a greater chance for absorption of the bacterial toxin.

Antibiotics are generally not necessary as the infection is self-limiting. Routine use of antibiotics may promote the carrier-state. However, in young infants and amongst children with systemic bacterial spread, the use of antibiotics is necessary.

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References

1. World Health Statistics Annual 1989. Mortality and Morbidity: Global Estimates. World Health Organisation, 1989:11-2.
2. Quak, S.H. Patterns of Acute Gastroenteritis in Singapore. J Singapore Paediatr Soc 1987; 29 (Suppl 1):159-64.
3. Quak, S.H. Gastrointestinal Infections in Singapore Children. Am Acad Med Singapore, 1991; 20:265-8.
4. Rubenstein, A.D., Feuster, R.F., SMith, H.M. Salmonellosis as a Public Problem in Wartime. Am J Public Health 1944;34:841-7.
5. Kauffman, A., Feeley, C., DeWitt, W. Salmonella Excretion by Turtles. Public Health Rep 1967; 82:840-4.
6. Goh, K.T. Diarrhoeal Diseases Surveillance in Singapore. In: Epidemiological Surveillance of Communicable Diseases in Singapore. Southwest Asian Medical Information Centre 1983; pp 89-130.
7. Lam, S., Tan, S.E. Salmonella Infections in Singapore. Ann Acad Med Singapore 1981; 10:34-91.
8. Grady, G.F., Kauseh, G.T. Pathogenesis of Bacterial Diarrhoeas. N Engl J Med 1971; 285: 831-91.
9. Chung, A.W. The Effect of Oral Feeding at Different Levels on the Absorption of Foodstuffs in Infantile Diarrhoea. J Pediatr 1948; 33:1-13.
10. Quak, S.H., Low, P.S., Quah, T.C., Teo, J. Oral Refeeding Following Acute Gastroenteritis: A Clinical Trial Using Four Refeeding Regimes. Ann Trop Paediatr 1989; 3:152-5.
11. Wong, H.B. Rice Water in Treatment of Infantile Gastroenteritis. Lancet 1981; 11:102-3.
12. Mehta, M.N., Subramaniam, S. Comparison of Rice Water, Rice Electrolytes Solutions, and Glucose Electrolyte Solution in the Management of Infantile Diarrhoea. Lancet 1986; i:843-5.

An interview with Ms Mary Bartholomew on the role different professionals play in meeting the health needs of consumers

by Kath Walsh

With consumers taking more responsibility for their health and well-being and wanting more up-to-date information on nutrition and current health issues, the health and food industries are seriously taking note and responding to these demands of their consumers. One professional, currently involved in advising food industries on how to meet these consumer needs, is Ms Mary Bartholomew, Managing Director of Gibson Public Relations, the Singapore office of the worldwide public relations group, Shandwick Pte Ltd. Ms Bartholomew, who has spent many years in the public relations business and is also a member of the Institute of Health Education (UK), talked with SNDA on the ways industry and health professionals are meeting these challenges.

SNDA: Why do you think there has been an increase in interest shown in nutritional values by food companies?
Bartholomew: People today are more health conscious and so concerned about what they eat. This is especially true in Singapore. Food companies are genuinely responding to consumers' demands. One example is displaying the nutritional content on packaged food. The public want to be able to make informed choices in relation to good and healthy eating.

SNDA: What is the role of the health educators in getting their message across?
Bartholomew: The health educators are the best people to advise on what constitutes a balanced diet for different age groups and lifestyles. They can also encourage improved eating habits through direct contact with the public as well as advising other categories of health professionals, such as nurses, on the current thinking in this area. Healthy eating should also be considered in the context of healthier lifestyles, which usually means regular exercise as well.

SNDA: How can individual professionals become more actively involved in promoting health and nutrition?
Bartholomew: Health education messages are often conveyed through articles in popular magazines and phone-ins on the radio. Shopping centres have displays or there may be leaflets in supermarkets or doctors' surgeries. Today more people are considering the nutritional benefits (is it doing me good?) as well as the taste of the food they are eating. It doesn't have to be boring though. There is nothing wrong with having treats, like chocolate or ice cream bars, as long as they are part of an overall balanced diet.

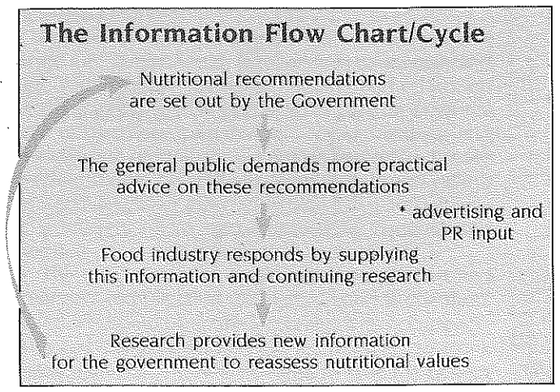
SNDA: How can food professionals influence the general public?
Bartholomew: Food industry professionals usually advise on food labelling as well as advertising claims. It is incumbent on food suppliers to provide more information on the nutritional values through nutritional labelling of their packaged goods. They can also offer advice by distributing informative leaflets at shops and supermarkets and by offering a consumer advice service.

SNDA: Where do you see the future of nutrition in relation to the media?
Bartholomew: Readers are asking increasingly for more informed articles on not just what constitutes a balanced diet but information on various nutrients and how to create a healthy meal. Statistics show more people are considering a semi-vegetarian option, that is eating less red meat and consuming other alternatives, like chicken and fish, and increasing their fruit and vegetable intake.

Most features on food which appear in magazines and newspapers these days are usually well-informed and have more educational value than perhaps in the past.

SNDA: Do you see a need for advertising and public relations companies in Singapore to use the services of dietitians and nutritionists for health campaigns?
Bartholomew: Definitely, advertising and public relations people are communication professionals and need the support and services of food and health professionals so that the information they convey is accurate, nutritionally sound and not in conflict with what is recognised as good nutritional practice.

Gone are the days when it was possible to make sweeping statements that were at best superficial and at worst totally misleading. We have entered an era of consumerism, where consumers want to make informed choices. Health professionals need to respond to this and provide help and guidance to achieve a healthier lifestyle for all.



Kath Walsh is currently Principal Lecturer, Language and Communication Skills Centre, Ngee Ann Polytechnic, Singapore, and an active member on the Editorial Board of the SNDA.

The Obesity — Diabetes Connection: Cause & Control

on 5 December 1992 at 2pm
Raffles City Convention Centre, Level 4,
Westin Stamford & Westin Plaza

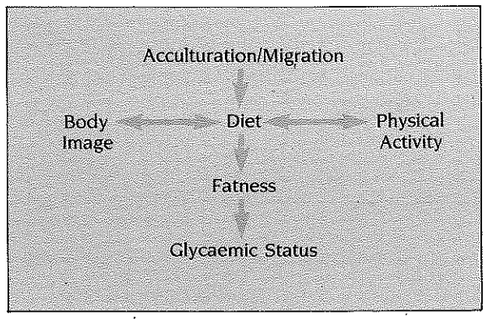
Reviewed by Diana Peers, B.Sc., SRD, RDS.

The aim of this seminar, presented by the Endocrine & Metabolic Society of Singapore, was to discuss the association between obesity and diabetes and appropriate clinical management strategies.

Professor Mark L. Wahlqvist, Chairman of Medicine at Monash Medical Centre, Melbourne, Australia, described the connection between obesity and diabetes.

Genetically prone individuals may never develop obesity or diabetes. Environmental factors which alter energy balance appear to influence the gene expression, and so affect glucose turnover. Although these processes are still poorly understood, the relationship between intra-abdominal fat and dysmetabolism (glycaemic) is being increasingly recognized. The increased flux of free fatty acids from omental (or abdominal distribution of) adipose tissue to the liver, results in changes for gluconeogenesis, insulin resistance and hyperlipo-proteinaemia.

Factors affecting the relationship between glycaemic control and obesity,



It is thought that omental fat distribution is influenced by many factors. Many studies have shown the effect of migration, from a developing to a developed country, on changing the risk factors of the migrant population to match their new environment.

Energy values of foods have been specifically related to the problems of the so called "diseases of affluence", including obesity. Recent research into the oestrogen content of foods suggests that plant foods with a high oestrogen content eg. soya and sprouts, may be protective against abdominal fat distribution. Interestingly, recent research in Singapore suggested that a decreased intake of soy products in the diet may be related to a higher incidence of breast cancer.

Further research is obviously needed in this area, particularly in comparison with animal products known to contain oestrogen compounds eg. cow's milk, carcass meat.

Many studies have examined the relationship between body image and dietary intake, particularly in eating disorders. Recent research looked at a group of 70 year old men, who, it was found, perceived themselves to be underweight and they wanted to weigh more. In actual fact they were actually overweight, with consideration to the depletion of lean body mass and increasing age.

Studies into physical activity suggest that a combination of diet and exercise to encourage weight reduction significantly promotes a lowering of the BMI, compared to dietary modification alone.

Cigarette smoking and sex are also known to affect the likelihood of becoming obese or overweight, with an omental fat distribution.

Multifactorial arguments continue to draw together the relationship between glycaemic control and obesity.

In research, anthropometric measurements, including the waist:hip Ratio (WHR), measurement of abdominal girth, and Body Mass Index (BMI) have been applied, although standard measurement techniques have yet to be established for the WHR, before these studies can be validated.

Other workers suggest that the consequences of intra-abdominal races show a shift in body fat distribution on migration suggesting environmental influences, and it has been postulated that other groups show a higher risk for the development of diabetes with such an increasing abdominal fat distribution.

In his summary, Dr Wahlqvist suggested that greater attention may need to be paid to increases in intra-abdominal fat distribution and the development of impaired glucose tolerance (IGT), without defined obesity or diabetes.

Professor A.C. Thai described a Singapore population based cross-sectional study examining diabetes in the obese during 1982-85. The multiracial population then, of 2.6 million, comprised 76.5% Chinese, 14.8% Malay, 6.4% Indian and 2.3% others.

The survey examined 2143 individuals, aged 18 — 69 years. Measurements of Body Mass Index (BMI) and fasting plasma glucose (FPG) were taken. Age adjusted mean BMI's for males were not statistically different (Chinese 22.3%, Malay 23.1%, Indian 22.5%), however BMI's for female Malay (25.1%) and Indian (24.6%) were higher than Chinese (22.2%).

After risk factor correction a direct relationship was seen between BMI and FPG measurements, for both sexes in the 18 — 69 age group. By BMI category, mean FPG levels for both sexes were lower in the "normal" weight BMI range (5.1 mmol/l) compared to the "overweight" (5.4 mmol/l), and "obese" (5.5 mmol/l) patients respectively.

In the 40 — 69 age group, diabetics had a higher

mean BMI compared to the whole study population. For Chinese (males 24.9% v 23.1%, and females 25.7% v 23.9%) and Malay males (26.5% v 24.2%). However, for Malay females (27.9% v 27.2%) and Indians (males 23.8% v 23.5% and females 24.8% v 26.7%) there was no difference between diabetics and non-diabetics.

A higher prevalence of diabetes was also noted in obese or over-weight Chinese and Malay males and females, with less difference noted between male and female Indians.

Diabetes prevalence rates were five times higher in the obese/over-weight group for males (20.3% v 4.2%) compared to normal weight individuals, and three times higher for females (9.2% v 3.0%).

It was concluded that obesity is a major risk factor for diabetes. Obesity appears to be less important in Indians, compared to Chinese and Malay, and so cannot explain the higher prevalence rates for diabetes in Indians.

Reference

1. Diabetes in the Obese: A Singapore Population Study. Thai AC and Hughes K. Dept. of Medicine and Dept. of Community Occupational and Family Medicine, National University of Singapore.

Book Review:

THE HEALING FOODS

Reviewed by Lynn Alexander, B.Sc. (Hons) SRD, RDS.

The Healing Foods
Patricia Hausman and Judith Benn Hurley
Dell Publishing, 1989. New York.
461 pp
Softcover
Price S$19.90

Description

This interesting-titled book is a refreshing approach to informing the public on matters of nutrition. "The Healing Foods" discusses the scientific links between food and disease. It is loaded with practical information on how to incorporate foods essential to health into everyday eating habits.

The author's stance is that dozens of foods can actually help prevent or ease a variety of ailments from arthritis and diabetes to high blood pressure and cancer.

It is clearly stated, however, at the beginning of the book, that the information is intended to help one make informed decisions about diet, not as a substitute for any treatment that may have been prescribed by one's physician.

Patricia Hausman is the president of the American Nutritionists' Association and former staff nutritionist at the Centre for Science in the Public Interest. She now heads her own publishing company. She holds a master's degree in nutrition and is a prolific writer. Her previous books include "The Right Dose;;, "The Calcium Bible" and "Foods That Fight Cancer". Her co-author, Judith Benn Hurley, is a culinary expert and food journalist.

Organised in easy to follow alphabetical format "The Healing Foods" spotlights more than 100 foods and diseases. Some of the conditions covered include lactose intolerance, ulcers, stroke, skin problems, overweight, osteoporosis, kidney stones, insomnia, haemorrhoids. It also contains nutritional charts and recipes, and a section listing the best food sources for the most important vitamins and minerals. Several 7-day meal plans are included — one, for example, under the section on osteoporosis, is "a week of bone building meals", specially designed so that each day's meals provide at least 1000 mg calcium.

Leafing through the pages, one is drawn by lovely headings such as:
"Grapefruit — golden and good for you"
"Headache — when food goes to your head"
"Soybeans — soy to the world"
"Yoghurt, low fat — catch some culture."

Lynn Alexander is the Vice-President of the SNDA and member of the Editorial Committee. She is currently Clinical Dietician at Gleneagles Hospital.

The style is light and reads easily. Take what the authors write about chick peas, for example:

"Chick peas — chock full of good things (about 216 calories per cup, cooked)

"They looked funny and their name is even funnier. But when it comes to nutrition, chick peas are nothing to laugh at. Also known as garbanzo beans in the US and Bengal gram in Eastern countries such as India, chick peas are getting some serious attention from Western nutritionists.

"Americans are a little behind the times we must admit. Twenty five years ago when lots of supermarkets in the country didn't even stock chick peas, researchers overseas were on the trail of their special health benefits. Their interest was piqued when a survey showed that poor residents of northern India had far lower blood cholesterol levels than bigger-income residents. Suspecting that the chick-pea rich diet eaten by the poor people was the reason, researchers proceeded to put this hunch to the test. In a pioneering study, wheat and cereals in the diet of the rich were replaced with chick peas. Cholesterol levels fell dramatically — an average of 56 mg — during the chick-pea splurge.

"Even if your cholesterol level needs no improvement, chick peas have much to offer you. A cup of cooked chick-peas provides lots of protein.fibre, iron and potassium, as well as substantial amounts of the B vitamins thiamin and niacin. All delivered of course without high levels of fat or sodium."

The authors have a knack of summing up nutrition stories very succinctly. Following is their run-down on cholesterol and shellfish in a story entitled "Cholesterol chaos":

"Twenty five years ago when concern about cholesterol was just beginning, the US Dept of Agriculture published tables showing shellfish to be very high in cholesterol. It was an alarm heard around the world and as a result shellfish became a no-no for cholesterol watchers who had been advised to limit their cholesterol intake.

"But it was a false alarm in a sense. A decade later it became clear that the method used to calculate the cholesterol content of shellfish was flawed. So the USDA scientists went back to the laboratory and tried again. Their new results — which have been confirmed recently — showed that most shellfish contain cholesterol in amounts similar to common meats such as beef and poultry. Besides, shellfish contain also no saturated fat, which we now know influences our blood cholesterol levels even more strongly than the cholesterol in our diet.

"Unfortunately to this day some people remain unaware of all this and still consider shellfish unfriendly to the heart."

They then go on to give figures showing original and revised values for cholesterol content of common shellfish.

Particularly interesting for believers in traditional food cures is a story under the section "Colds". The authors have written:

"Score another one for folk wisdom. The winner this time is chicken soup. The age old cold remedy now has some science behind it. Workers at Mount Sinai Medical Centre, New York City, credited hot chicken soup — but not hot water — with increasing the flow of mucus, thereby helping to relieve congestion. Exactly what ingredient in the soup does the job remains a mystery. Soup is of course a fluid and therefore to be encouraged to replace what the body loses to fever and sweating."

Besides scientific findings, the authors cite other interesting little snippets about the "healing foods". On the topic of "Oats", for instance, they point out, that taking oat bran is often a less expensive way to lower cholesterol than drugs. And they explain that the only difference between regular oats and quick oats are that the regular are whole flakes while the quick ones have been cut in a way that makes them cook faster. Either way you still get the goodness of the whole oats.

This book is a return to positive messages that food is potentially good for us instead of all the negative messages about how bad food is. It is for those people who feel "there's nothing left to eat", and it will go a long way towards clearing confusion about health properties of foods.

Ninth Annual Meeting of the Singapore Nutrition and Dietetics Association

The Ninth Annual General Meeting of the Singapore Nutrition and Dietetics Association was held on 24 April, 1993 at the Regional English Language Centre, Singapore.

Twenty seven full members, six associate members and one guest attended the function. The President's report for the year 1992 — '93 presented at the AGM is reproduced in full in this issue.

The high tea following was attended by Association's members. Every one went home laden with generous gifts donated by several local food companies and in addition a few lucky winners received lucky draw hampers and prizes too.

Each year the AGM serves as an evening at which members can meet each other and evaluate and appreciate all that the bearers for the year 1993 — '94 was held and volunteers for the continuing education and Editorial sub-committee were recruited.

Main Committee Members 1992 — '93. From left to right:
Sitting: Lynn Alexander, Yeong Boon Yee, Sue Hixson, Nicola Gilbert.
Standing: Tan Wei Ling, Evelyn Fong, Annie Ling, Lisa Choi, Germaine Heng, Margaret Hays.

Main Committee Members 1993 — '94. From left to right:
Sitting: Lynn Alexander, Yeong Boon Yee, Sue Hixson, Germaine Heng.
Standing: Georgina Stable, Beatrice Pung, Emily Mok, Myriam Young, Annie Ling, Lisa Choi, Margaret Hays, Carolyn Begin.

Editorial Committee Members 1993 — '94. From left to right:
Lynn Alexander, Annie Ling, Anna Jacob, Kath Walsh, Bridgette Fenby.

ABSTRACTS

METABOLIC AND ANTHROPOMETRIC CHANGES WITH WEIGHT CYCLING IN WRESTLERS. L.J. *McCargar and* S.M. *Crawford. Medical & Science in Sports & Exercise*, 24, 1270-1275, 1992.

This study identified the metabolic and anthropometric changes that occur with cycles of rapid weight loss and regain in competitive wrestlers. Collegiate wrestlers were divided into "cyclers" and "noncyclers" based on their reported dieting history. Measurements included a 3-day diet record, resting energy expenditure (REE), skinfold and girth measures, and biochemical tests at three time points: preseason, peak season, and off-season. All anthropometric measures changed with time, and a diet group by time interaction was observed for the trunk to extremity skinfolds ratio; there was greater fat loss and regain from the trunk area of the weight cyclers. There were no differences in REE within or between groups. Serum triiodothyronine values decreased over time. It appears that large weight losses ocurred because of both dieting and short-term dehydration. Although physiological changes were observed, a training effect may have overridden any metabolic influence of weight cycling. An incidental but critical finding was that these athletes considered dehydration and dieting as synonymous. Their use of the word "diet" is in association with weight loss, not necessarily with food restriction.

LONGITUDINAL STUDY PURSUES QUESTIONS OF CALCIUM, HORMONES, AND METABOLISM IN LIFE OF SKELETON. T. *Randall. The Journal of the American Medical Association*, 268, 2357-2358, 1992.

The study of calcium physiology in perimenopausal women involved a 25-year follow-up of bone health in 169 Roman Catholic nuns who were enrolled during their 40's. Every 5 years, the women completed a battery of 150 to 200 tests that evaluated calcium absorption and balance, hormonal levels, and bone metabolism. The calcium bioavailability of many foods eaten by these subjects were examined by precise isotope methods. It was found that the solubility of a calcium product has little effect on the absorbability of calcium. The calcium absorbability of spinach is barely above zero. (same is true for iron absorbability in spinach.) The calcium absorbability of wheat bread is quite good, and wheat bread can be a major calcium source for persons who eat a lot of bread. Yeast in leavened breads helps increase the bioavailability of calcium slightly by intefering with phytic acid. Green and leafy vegetables such as broccoli, bok choy and kale have very good calcium absorbability, slightly higher than milk. (Bok choy is the best calcium bargain per unit of energy, supplying 1,800 mg calcium per 100 kcal.) Soybeans have a calcium absorbability that rivals milk; other beans, such as navy, pinto and red, are half as good. Drinking milk is still the only convenient way to consume all the calcium one needs.

A PROSPECTIVE STUDY OF NUTRITIONAL FACTORS AND HYPERTENSION AMONG US MEN. A. *Ascherio*, E.B. *Rimm*, E.L. *Giovannucci*, G.A. *Colditz*, B. *Rosner*, W.C. *Willett*, F. *Sacks, and* M.J. *Stampfer. Circulation*, 86, 1475-1484, 1992.

The relationships between various nutritional factors and hypertension were examined among 30,681 predominantly white American male health professionals aged 40 to 75 years without diagnosed hypertension. During a 4-year follow-up, 1,248 men reported a diagnosis of hypertension. Age, relative weight, and alcohol consumption were the strongest predictors for development of hypertension. Dietary fibre, potassium, and magnesium were each significantly associated with lower risk of hypertension when each nutrient was considered individually and after adjustment for age, relative weight, alcohol consumption, and energy intake. When these nutrients were considered simultaneously, only dietary fibre had an independent inverse association with hypertension. For men who consumed less than 12 g fibre per day, the relative risk of hypertension was 1.57 compared with men who consumed more than 24 g fibre per day. Calcium intake was significantly associated with lower risk of hypertension only in lean men. There were no significant associations between hypertension and intake of sodium and total, saturated, transunsaturated, or polyunsaturated fatty acids. Fruit fibre, but not vegetable or cereal fibre, was inversely associated with incidence of hypertension.

NUTRIENT INTAKE AND GROWTH IN PRESCHOOL CHILDREN. I. COMPARISON OF ENERGY INTAKE AND SOURCES OF ENERGY WITH GROWTH. J. A. *Payne and* N.R. *Belton. Journal of Human Nutrition and Dietetics*, 5, 287-298, 1992.

One hundred and fifty-three healthy children aged 2-5 years from Edinburg were studied between May, 1988 and April, 1990. A subset of 54 children were assessed twice, 12 months apart. Nutrient intake was determined by the 7-day weighed inventory method. Anthropometric measurements taken included height, weight and skinfold thickness.

Despite low group mean energy intakes of 80 – 85% of the current UK Estimated Average Requirement of Energy (DoH. 1991), the children were apparently growing normally. Anthropometric measurements were within the normal range for age and no significant relationship was found between energy intake and rate of growth, suggesting that energy intake was adequate.

Considerable variation was found in composition of diets. A highly significant negative correlation was found between the percentage of energy from fat and that from sugars and a significant positive correlation between total energy intake and fibre intake. However, as no relationship was found between energy intake and percentage of energy from fat, sugars and starch. So it was concluded that the composition of the diet did not apparently influence total energy intake.