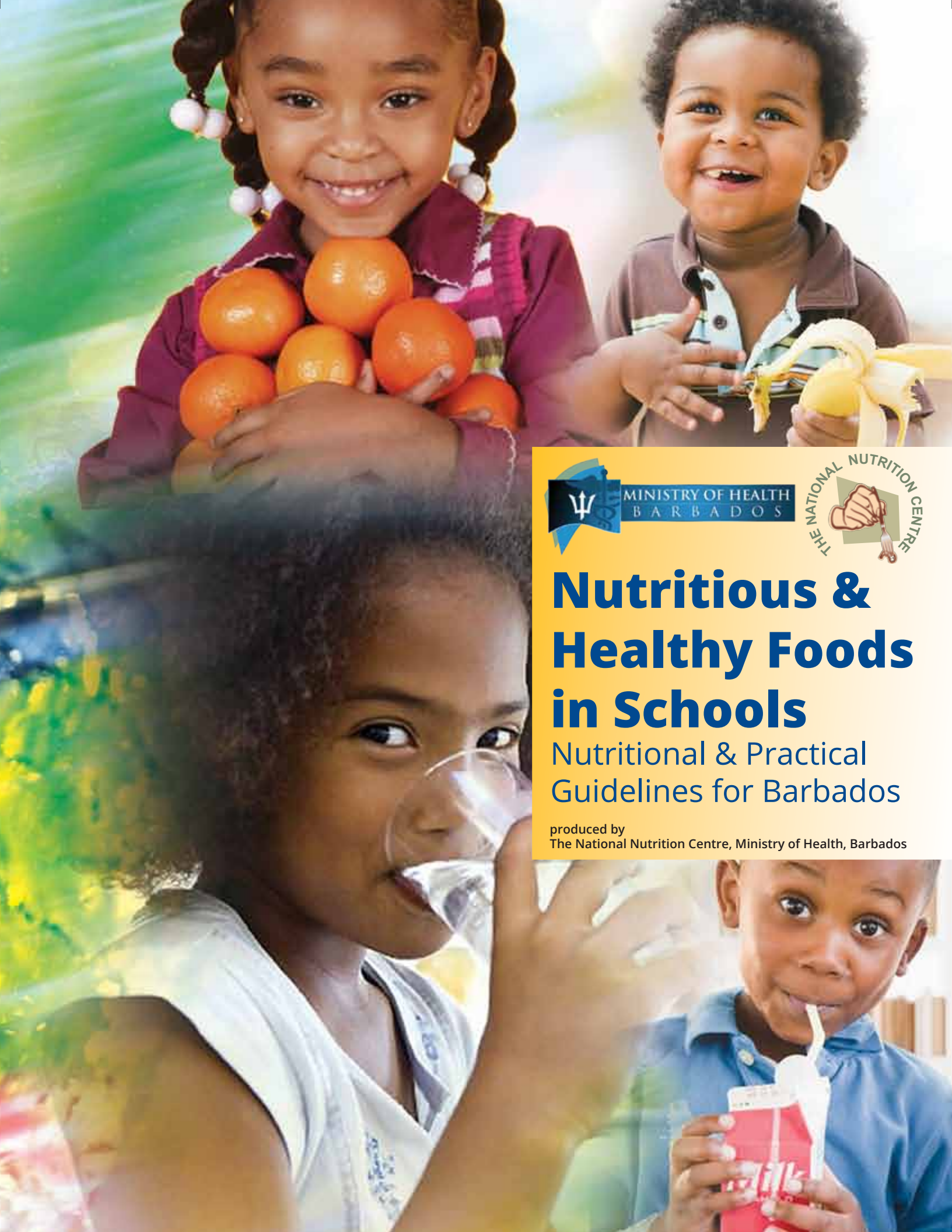

MINISTRY OF HEALTH
BARBADOS

THE NATIONAL NUTRITION CENTRE

Nutritious & Healthy Foods in Schools

Nutritional & Practical Guidelines for Barbados

produced by
The National Nutrition Centre, Ministry of Health, Barbados

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Nutritious and Healthy Foods in Schools: Nutritional and Practical Guidelines for Barbados

Foreword

Every country is responsible for maintaining and protecting the health of its children and young people – its next generation of citizens. Although it is well-known that adequate nutrition is essential for proper growth and development, it is now widely accepted that healthy eating is also a significant factor in reducing the risk of chronic non-communicable diseases (NCD's).

The National Nutrition Centre has been providing nutrition information and advice since 1972 and this document, ***Nutritious and Healthy Foods in Schools: Nutritional and Practical Guidelines for Barbados*** is intended as a guide for health professionals, policy makers and other stakeholders. The guidelines may be used to assist governmental agencies in the development of policies designed to improve the effectiveness of nutrition education efforts, directed both to schools and at the national level. They can also be used to assist health care providers in primary diseases prevention efforts. Improving the health and nutrition of children and young people is becoming increasingly urgent and the National Nutrition Centre recognises its own role in the provision of clear and up-to-date dietary guidelines for all of the stake-holders.

The guidelines are a distillation of current knowledge about the relationship between diet, growth and development, and disease; the nutrients available in the local food supply; and the strong rationale showing that eating well in school could play a major part in protecting the nation's health and reducing the burden of preventable diet-related illness and increased mortality among Barbadians. Their implementation could result in significant health gains for the community and the potential economic benefit of an effective nutrition-based preventive strategy is enormous.

The underlying principles for these recommendations involve nutritional adequacy through the consumption of a variety of foods (selected from the Caribbean Food Groups). Reduction of chronic disease risk is promoted through moderate intake of fats, saturated fat, cholesterol, sodium and sugar and increased vegetable and fruit consumption. Given the increasing prevalence of overweight and obesity among children and young people in Barbados, the guidelines not only focus on the appropriate amounts of food for growth but also encourage children and young people to be physically active. It must however be noted that these guidelines are for healthy children and young people, aged 4 to 18 years, and may not satisfy the specific requirements of those with particular diseases or conditions.

Contents

Introduction

Aims of these guidelines

The aims of these guidelines are:

- To provide clear, evidence-based information about the relationship between good nutrition, physical activity and its impact on the health and development of children and young people.
- To provide nutrient-based standards, which can be used to develop suitable menus so that healthy food and drinks can be offered in schools.
- To encourage schools to develop and implement food policies which promote healthy eating throughout the school.
- To act as a resource document for health professionals and policy makers.

Persons who can use these guidelines

The guidelines are aimed at anyone who wishes to make improvements to school food:

- Ministers and policy makers who are responsible for governing the standards for food in schools.
- Health professionals who are involved in nutrition education in schools.
- Boards of Management at schools who require information on how to promote healthy eating.
- Caterers, food service managers and other staff, governmental and private, who are responsible for:
    - Menu planning in schools
    - Staff recruitment and staff training
    - Food purchasing and procurement
    - Preparation and service of food in schools
    - Sanitation
- Parents, parent teacher associations and other voluntary groups who support healthy eating in schools.
- Non-governmental organisations, journalists and others with an interest in nutrition relating to children and young people.

Section I: Nutritional Guidelines

Chapter 1

Why We Need Nutritious and Healthy Foods in Schools

Food-based dietary guidelines for Barbados

The *Food-Based Dietary Guidelines for Barbados*, also prepared by the National Nutrition Centre, aim to promote healthy eating habits and active lifestyles to prevent chronic nutrition-related diseases. These guidelines, although aimed at the healthy adult population, form the basis for the recommendations in this report. Special consideration was also given to certain specific nutrients of particular concern to children and young people. The *Food-Based Dietary Guidelines for Barbados* advise Barbadians to:

- Enjoy a variety of foods every day
- Eat vegetables every day
- Eat fruits every day
- Use high fibre foods every day
- Choose to eat less fat and fatty foods every day
- Use less salt and high sodium foods
- Use less sugar, sugar containing foods and sugary beverages
- Engage in physical activity every day

Current school meals service

Schools come into contact with at least 95% of all children aged 5-17 years (1). Schools have a tremendous opportunity to provide nutritious foods, encourage the development of good eating habits and create an environment conducive to helping children and young people meet their daily nutritional needs. It is, therefore, essential that the foods available in schools meet age-appropriate nutrient-based standards.

The School Meals Department provides lunch daily for 74 primary schools including the Ann Hill School and the Irving Wilson School, seven nursery schools, the Erdiston Annex and four other schools (St. Patrick's Roman Catholic School, the Challenor School, the Learning Centre and the Children's Development Centre) and approximately 12 secondary schools. Private caterers service schools and tertiary institutions not provided for by the School Meals Department. This includes approximately 25 public and private secondary schools.

The School Meals Programme provides up to a third of the requirements for energy (calories), vitamin A, vitamin C, calcium and iron for all children (1). The provision of one third of a child's overall daily nutrition is an immense contribution and, clearly, there is much to be gained from participation

in such a programme. Presently, the School Meals Programme does not offer a choice at lunch and consideration could be given to offering alternative food options as part of the Programme.

School canteen operators, for obvious reasons, place emphasis on the commercial viability of food services which results in the offering of popular, but not necessarily healthier food options. Furthermore, pricing may encourage the selection of certain items and discourage others. For example, a portion of French fries, which is high in fat, is usually an economical menu option.

The benefits of nutritious and healthy foods in schools

According to the WHO Global School Health Survey (GSHS, 2011), 32% of Barbadian students aged 13-15 years old are overweight, including 14% who are obese (2). The GSHS also found that 73% of students drank at least one carbonated beverage daily, 15% had eaten no fruits or vegetables during the previous month, and 18.5% had eaten fast foods three or more times per week). Only 71% of these students were physically active for at least an hour most days of the week.

The findings of research carried out by the University of the West Indies among children 9-10 years old are also cause for concern. In the Barbados Children's Health and Nutrition Study, it was found that 36% of 9 to 10 year olds were overweight, including 17% who were obese (3,4).

Based on this information, other documented evidence from international organisations, observations by the National Nutrition Centre's Community Nutrition Officers, and an informal survey of foods provided by a number of secondary school canteen operators, the committee has drawn the following conclusions:

- Many children are consuming foods high in saturated fats and sugars and low in iron and calcium.
- Fruit and vegetable intake for many children does not meet the recommendation of 5 servings daily.
- A significant number of children are largely inactive, spending less than an hour a day participating in activities of moderate intensity.

According to the Barbados Food Consumption and Anthropometric Surveys (2000), "the finding that substantial obesity exists among young adults highlights the need to start action at an early age. Imaginative approaches are needed to make nutrition exciting to school children, and to strengthen further the existing school food, nutrition and home economics programmes" (5).

The potential for school meals to improve the health of children and young people cannot be underestimated, especially those from disadvantaged families. In addition to the immediate impacts on healthy growth and development, anecdotal evidence from individual schools supports a link between children who are well fed and improvements in attendance, concentration and achievement. Furthermore, nutritious and enjoyable school meals can encourage healthy eating habits and an understanding about food and health which children can carry into adult life.

Chapter 2

Food, Nutrition and Physical Activity for Children and Young People

This chapter provides information on the nutritional requirements of children and young people and discusses other important health issues. As stated previously, there has been little research done in Barbados on the eating habits of children and young people and so there is limited data on the prevalence of nutritional deficiencies or the incidence of overweight and obesity and other chronic diseases in this age group. Bearing this in mind, the Committee has chosen to focus on the nutrients and health issues that are the most likely to be of concern.

Growth and development

Good nutrition is essential for growth and development. Children and young people need additional nutrients during growth spurts and will usually experience an increase in appetite at these times. After infancy, adolescence is the most rapid period of growth. Growth spurts usually occur between 9 and 13 years in girls, and between 11 and 15 years in boys. Another growth spurt may occur in late adolescence however, growth spurts can vary from child to child.

Energy (calories)

Children and young people need energy for growth and development. Energy is measured in calories (kcals). The body gets energy from fat, carbohydrate and protein (and also from alcohol), but most energy needs are met by fat and carbohydrate. Current recommendations (6) are that 15-30% of total energy should come from fat, and about 55-75% should come from carbohydrate, with protein providing about 10-15% of total energy.

However, there are also recommendations for the proportion of total energy that should come from different types of fat – such as saturated and unsaturated fats. Studies in the United Kingdom (6) have found that, in all age groups, more of the fat in children's diets was from saturated fats than is currently recommended and there is no evidence to suggest that the situation in Barbados is any different. Similarly there are recommendations for the different types of carbohydrates, including the proportion of total energy that should come from sugars. Again, the UK study found that in all age groups children consumed more sugar than is currently recommended.

Energy requirements of children and adolescents

The energy requirements of children and young people are summarised in the table of Recommended Dietary Allowances for the Caribbean in Appendix 1. A child's energy requirement is influenced by size, rate of growth and activity levels (7). The values in Appendix 1 represent averages for children 4 to 18 years.

In consultation with the Caribbean Food and Nutrition Institute (CFNI), the Committee elected to recommend that lunch at school should provide less than the one third usually recommended. Given

the fact that children usually consume snacks in addition to three meals daily and the predisposition to obesity implied by the *Barbados Food Consumption and Anthropometric Surveys* (2000), it is important that the school meal meet the nutritional needs of the child without contributing excess calories. It is not known how many children in Barbados meet the average daily energy intakes but children do gain weight if they consume more calories than their bodies need. Children and adolescents who engage in very little physical activity have lower energy requirements. Therefore, a nutrient standard for breakfast, lunch and dinner could be 30% each with 10% for snacks since anecdotal data suggests that most children eat at least one snack daily in addition to the three main meals.

Fat

Fat is the most concentrated source of energy in the diet. Each gram of fat supplies 9 calories compared with protein and carbohydrate, which each supply 4 calories per gram. Fat is necessary in the diet as it helps with the absorption of vitamins A, D, E and K. Fat in the diet can be categorised as follows:

- **Saturated fats** are mainly from animal sources. As with adults, high saturated fat intakes among children are associated with raised blood cholesterol levels. Long-term studies have shown that blood cholesterol levels 'track' through childhood and adolescence into adulthood and are a major risk factor for coronary heart disease in later life (9,10).

- **Trans fats** include partially hydrogenated oils, which are found in foods such as cakes, pastries and fast foods. Although trans fats also occur naturally in some animal foods evidence suggests that trans fats from partially hydrogenated and hydrogenated oils may increase the risk of cardio-vascular disease.

- **Unsaturated fats** are found mainly in plants and fish. They include monounsaturated fats and polyunsaturated fats, which are found in vegetable oils and **omega-3 fatty acids** found in oily fish, such as mackerel, salmon, sardine, and tuna. Omega-3 fatty acids are thought to be beneficial for heart health.

Carbohydrate

Carbohydrate is a source of energy and includes both starch and sugars. Foods containing starch include staples like rice, pasta, bread, ground provisions and legumes (dried peas, beans and nuts). Sugar is found naturally in fruits, vegetables and milk. High levels of sugar can be found in less nutritious foods and beverages like sweets, cakes, biscuits, soft drinks, sports drinks, fruit drinks and juices. Honey and syrup are forms of sugar.

The addition of sugar to the diet of children and adolescents is not necessary in order to meet their energy requirements. They can meet their energy needs with other carbohydrate foods. If children and adolescents consume excessive amounts of foods and beverages high in sugar it may be difficult for them to eat adequate amounts of more nutritious foods, which would provide the other nutrients they need daily. Furthermore, the development of overweight, obesity and tooth decay are related to the amount and frequency of sugar in the diet (6).

Fibre

Fibre is the indigestible part of plant foods. It plays a role in the prevention of constipation and other bowel disorders. Fibre also lowers cholesterol and blood pressure.

High fibre foods include staples like whole grain breads and cereals, legumes (dried peas, beans and nuts), fruits and vegetables. These foods also provide a combination of other important nutrients. When fibre is increased, or if children appear constipated, it is important to increase daily fluid intake.

Protein

Protein is needed for growth, maintenance and repair of body tissues. There is little evidence to suggest that protein intakes of the majority of children and young people in Barbados are deficient. In fact, anecdotal evidence suggests that many children consume up to twice the amount of protein that is actually recommended.

Protein is available from both animal and vegetable foods. Sources of protein include milk, cheese, meat, poultry, fish, eggs, legumes (dried peas, beans and nuts) and soy products (granules, chunks and tofu).

Vitamins and minerals

There are a number of essential vitamins and minerals of particular importance when considering the needs of children and young people. Most children should be able to get all the vitamins and minerals they need by eating a varied diet selected from the Caribbean Food Groups (Appendix 2).

Vitamin C, iron and calcium are nutrients of particular concern when considering the needs of children and young people. The Committee recommends that lunch at school should aim to provide at least 40% of the maximum RDA for vitamin C and iron to address the pervasive problems of anaemia (5) and because teenage girls are at specific risk for low iron levels. At least 30% of the maximum RDA for calcium should also be provided (Appendix 1). For more information on vitamin C, iron and calcium see Table 1.

Table 1: Function, importance and food sources of vitamin C, iron and calcium

Nutrient	Functions and importance	Food sources
Vitamin C	• Needed to produce collagen, the foundation material for bones, teeth, skin and tendons • Important in wound healing • Has a role as an antioxidant in preventing damage to cells and tissues • Increases the absorption of iron if both nutrients are present at the same meal	• All fresh fruits and vegetables, 100% fruit and vegetable juices – aim for 5 servings fruits and vegetables daily • Potatoes and ground provisions • Fortified breakfast cereals
Iron	• Part of haemoglobin in blood, which carries oxygen • Prevents iron-deficiency anaemia	• **Haem iron**: liver, meat, chicken and fish. Haem iron is easily absorbed by the body • **Non-haem iron**: eggs and plant foods like cereals and grains, legumes (dried peas, beans and nuts) and dark green leafy vegetables (such as spinach and callaloo). Also found in fortified breakfast cereals. Non-haem iron is not absorbed easily and so it is important to include foods containing haem iron or vitamin C at the same meal, in order to improve absorption
Calcium	• Component of bones and teeth • Transmits nerve impulses and muscle actions • Plays a role in the maintenance of normal blood pressure	• Milk, cheese, yogurt • Fish with edible bones like sardines • Legumes (dried peas, beans and nuts) • Dark green vegetables including okra • Fortified breakfast cereals

Sodium

Salt (sodium chloride) is the main source of dietary sodium. Sodium is essential for fluid balance, but too much sodium is associated with high blood pressure in later life, which is a risk factor for heart disease and stroke (11). Adolescents who are obese may be particularly sensitive to the effect that sodium has in raising blood pressure (12). Children and young people who regularly eat processed meats (such as hot dog, hamburger, luncheon meat and chicken nuggets), fast foods or snack foods such as chips, corn curls or salted nuts are probably getting more sodium than recommended.

As a means of reducing sodium intake, children and young people should be encouraged to consume fresh or frozen meat, fish, poultry and vegetables since they are naturally low in sodium. Foods should be prepared with little or no added salt: herbs and spices can be used to add flavour. Reading Nutrition Facts labels or ingredients lists can aid in the selection of lower sodium options.

The National Commission for Chronic Non-Communicable Diseases has recommended that Barbadians reduce the amount of sodium in their diets and the Chronic Disease Research Centre, under the aegis of the Ministry of Health, in 2012 undertook "The Barbados Salt Intake Survey" (BSIS) to assess the average dietary salt intake of the general adult Barbadian population (aged + 25 years). At the time of preparation of these guidelines the results had not been published.

Physical activity

Physical activity, which includes exercise and sports, has an important role in enhancing physical, mental and social well-being as well as in preventing overweight. People who exercise are better able to regulate their food intake to match the amount of energy they expend (12).

The results of the Adolescent Health and Fitness (AHFIT) study of physical activity in Barbadian secondary school attenders, undertaken by the Chronic Disease Research Centre, found that 15% of 10-18 year olds (8% males, 20% females) did not participate in any form of physical activity on a regular basis (13).

In view of these findings, schools should create an environment where play and exercise are actively enabled and encouraged. It is recommended that children engage in at least 60 minutes of physical activity every day, such as brisk walking, cricket and netball (6). The recommended level of activity can be achieved all in one session or through several sessions of 10 minutes or more. See Appendix 2 for ways to encourage increased physical activity in children and young people.

Chapter 3

Nutrient-Based Standards for Foods in Schools

The nutrient-based standards are designed to meet the Recommended Dietary Allowances (RDAs) for the Caribbean (7). Recommended Dietary Allowances are the average amounts of energy and nutrients sufficient to meet the requirements of nearly all healthy individuals (98%) and provide a basis for planning meals. For the target age group 4-18 years, there are eight recommended energy allowances by age and gender. Calculation of the mean and variance suggested that two nutrient standards would be required to meet the energy needs of most children. These are 775 calories for boys 10-18 years and 580 calories for all other children (male and female). This means that in primary schools all children, except for class 4 boys, should be provided with a lunch supplying 580 calories and that class 4 boys should be provided with a lunch supplying 775 calories. For secondary schools students, girls should be encouraged to consume meals providing 580 calories and boys to consume meals providing 775 calories.

Table 2 summarises the proportion of nutrients that children and young people should receive from a school lunch. These Nutrient-based standards include values for energy, macronutrients (fat, saturated fat, total carbohydrate and protein), and selected micronutrients, vitamin C, iron and calcium. The figures are for the recommended nutrient content of an average lunch provided for children and adolescents over a one-week period. If school menus achieve these standards, and include a variety of foods selected from the six Caribbean Food Groups (Appendix 3), they are likely to make a significant contribution to the nutrients that children and young people need for growth and good health.

Table 2: Nutrient-based standards for school lunches for children and young people aged 4–18 years: Summary of recommendations

Energy and nutrients	Energy (kcal)	Fat (g)	Carbohydrate (g)	Protein (g)	Vitamin C (mg)	Iron (mg)	Calcium (mg)
Nutrient-based standards	30% total daily calories	Not more than 30%	Up to 75%	Not less than 30% RDA	40% of RDA	40% of RDA	30% of RDA
4-6 yrs Males	540	18	101	7	24	4	150
4-6 yrs Females	488	16	92	6	24	4	150
7-9 yrs Males	621	21	116	8	24	4	180
7-9 yrs Females	548	18	103	8	24	4	180
10-14 yrs Males	735	25	138	14	24	5	210
10-14 yrs Females	620	21	116	14	24	6	210
15-18 yrs Males	816	27	153	17	24	5	270
15-18 yrs Females	657	22	123	16	24	6	270

Recommended Daily Allowance (RDA) is the average daily dietary intake level that is sufficient to meet the nutrient requirements of nearly all (approximately 98 percent) healthy individuals. If people get more than this amount they will almost certainly be getting enough.

Implementing the nutrient-based standards

The nutrient-based standards should be used as the basis for planning menus, which aim to meet the recommended nutrient requirements of children and young people in schools. This means that food service providers in schools must be trained in the application of the standards in order for them to be effectively implemented. The nutrient-based standards should be applied to vegetarian options if they are included on the menu. As part of the training, consideration should also be given to food hygiene and safety, appropriate storage, preparation and holding methods as well as the aesthetic appeal of foods.

Educational messages and marketing strategies should be developed to promote the new standards in order to encourage children and young people to choose healthier food options. Time will be required for the canteen operators and their staff to implement the nutrient-based standards following the initial approval from the respective authority.

Adopting the standards in Primary Schools

A smooth transition with the implementation of the guidelines is expected in the primary schools since many of these standards have already been established by the School Meals Department. The adoption of these standards can only enhance the current school meals service.

Private primary schools, which do not benefit from the School Meals Programme, may require assistance in the implementation of the nutrient-based standards.

Adopting the standards in secondary schools

Most secondary schools in Barbados have canteens operated by private food service providers approved by the school's Board of Management. Food service providers should use the nutrient-based standards when planning menus for submission to the school board. Boards of Management should use the nutrient-based standards as their reference when considering the award of contracts.

The canteen system for school lunches allows students to choose between individual food items and full meals. Meal options meeting the nutrient-based standards should be heavily promoted and encouraged as the meal of choice for this group of young people. It is essential that every canteen service offer at least one full meal option (hot or cold) which meets the standards in these guidelines.

See Daily Food Guide (Appendix 4) and Suggested Food-Based Standards for Lunch (Appendix 5) for more information on planning meals.

Monitoring the nutrient-based standards

Compliance with the nutrient-based standards should be mandatory and the Ministry of Education will need to establish posts for registered dietitians (or qualified nutrition professionals with training in human nutrition and food service) to plan, co-ordinate and monitor all nutrition-related programmes and activities within the schools. At least one officer should be allocated to each school zone. The government's school inspection process should facilitate on-going monitoring and feedback of all food services provided in schools. Food service providers should also have their own system in place to routinely monitor their standards.

Section II: Practical Guidelines

Chapter 4

Canteen Lunches

School canteens have the opportunity to provide nutritious and healthy foods for children and young people and, at the same time, can encourage the development of good eating habits which can last a lifetime. It is critical then that canteens provide complete meals and individual food options which are tasty, economical, and attractive and can meet 30% of the child's daily energy requirements. A nutritious lunch should contain the following food groups:

- **Staples** such as bread, rice, potato, cou-cou.
- **Foods from animals** such as meat, chicken, fish, egg, or **legumes** such as dried pigeon peas, kidney beans, lentils and nuts. Ideally, a serving of fat free milk (skimmed) or low fat milk (1%) or other low fat dairy should also be included. Calcium-enriched soy milk is a suitable alternative.
- At least one serving of **fruit** *and* one serving of **vegetables**. Vegetables can be eaten as a side dish or incorporated into the main dish.

Appendix 6 contains a list of serving sizes of some common foods. The foods and snacks served in schools should be low in saturated fat, trans fat, cholesterol, salt (sodium) and added sugars. It is important for both parents and vendors to remember that unfamiliar foods may need to be combined with more familiar foods or prepared in more innovative ways in order to improve acceptance.

Suggestions for canteen operators

Although school canteens offer a variety of foods, many options exceed the recommendations for fat and sugar. As a result children can choose an unhealthy mix of foods. Canteen operators can improve the nutritional standard of their menus by implementing the nutrient-based standards detailed in this report and following the suggestions listed below:

- Prepare foods with little or no oil, margarine, butter or shortening.
- Remove skin from chicken and visible fat from meat before cooking.
- Limit the frequency of high fat foods such as macaroni pie and French fries/potato chips (see Suggested Food-Based Standards for Lunch, Appendix 5).
- Soy granules, which are a good source of protein and naturally low in fat, can be used as a partial or complete replacement for minced meat. (All dishes containing soy products should be clearly labelled.)
- Consider the addition of dried peas, beans or lentils in dishes such as soup, stew or roti and use less meat (or no meat at all).
- If milk is required in meal preparation, use fat free milk (skimmed).

- Fruit and vegetables should be served daily. Vegetables can be incorporated into dishes or offered as a side dish.
- Iron-rich and calcium-rich foods should be available daily (see Table 1, page 8).
- Suitable beverages should be readily available. These include water, fat free milk (skimmed) or low fat milk (1%), smoothies made with fat free milk or yogurt, low-sugar flavoured milk or calcium-enriched soy beverages (less than 10% added sugar), yogurt drinks and 100% fruit juice (4-8 ounces daily)
- Salt should **not** be made available at counters or at tables.
- Consider supplying condiments like ketchup and mayonnaise etc in individual packages.

Suggestions for parents

Parents can also play an important part in encouraging their children to make healthier choices. Listed below are some points to consider:

- Request a copy of the canteen menu from the school or request that the menu be displayed on a notice board.
- Discuss the menu with your child and help your child decide on the healthier options available. Encourage your child to limit fried or other high fat foods, like French fries, macaroni pie, patties, sausages or burgers, to no more than once a week.
- Recommend that your child choose beverages like water, fat free milk (skimmed) or low fat milk (1%), smoothies made with fat free milk or yogurt, low-sugar flavoured milk or calcium-enriched soy beverages (less than 10% added sugar), yogurt drinks and 100% fruit juice (4-8 ounces daily).
- Suggest that your child use less mayonnaise, salad dressing and ketchup as these are potential sources of additional fat and sodium. If this behaviour is practiced at home it is more likely to be continued at school.

- For break-time or after-school snacks encourage your child to have a fruit.

Chapter 5

Packed Lunches

When preparing packed lunches for children and adolescents, it is important to select a variety of foods from the Caribbean Food Groups (Appendix 2) in the appropriate amounts needed to meet approximately 30% of the daily nutritional requirements. Foods and snacks in packed lunches should also be low in saturated fat, trans fat, cholesterol, salt (sodium) and added sugars.

Attention should be given to ensuring that packed lunches are tasty, colourful and attractive, with a variety of textures. It is important for parents to remember that unfamiliar foods may need to be combined with more familiar foods or prepared in innovative ways in order to improve acceptance. Children can also be encouraged to get involved with the selection and preparation of the meals. To save time in the morning, some lunch items can be prepared the evening before.

Food safety for packed lunches

In order to prevent food-borne illnesses it is essential to practice good hygiene and keep foods at a safe temperature. Cooked food should not be kept at room temperature for more than two hours. The general rule is to keep hot foods hot and cold foods cold. Hot foods can be kept hot in suitable flask. Cold foods can be kept cold with an ice pack (or frozen water or beverage) and transported in an insulated cooler or cooler bag. Food containers should be washed and dried after each use.

Ideas for packed lunches

- Prepare sandwiches or wraps with whole wheat or multi-grain bread or buns, whole wheat pita pockets, flavoured tortilla wraps or roti skins.
- For sandwich fillings, or to add to salads, use chicken or other meat or fish, ham, tuna (drained), sardine, egg, low fat cheese, veggie burger, lentil pattie, cooked beans, bean spreads (like hummus) or peanut butter.
- Whole wheat or multi-grain crackers can be served with a protein spread or dip. Keep the spread or dip in a separate container until ready to eat.
- Rice or pasta in hot meals or salads
- Include fruits every day. Prepare fruits so that they are ready to eat and place in small containers or wrap in plastic so they stay fresh. Dried fruits, like raisins, or snack-size canned fruits or apple sauce are nutritious alternatives (remember to pack a spoon).
- Include vegetables every day. Add salad or coleslaw to sandwiches and chopped vegetables to rice and pasta dishes. Serve vegetable sticks (carrot, sweet pepper, cucumber, broccoli

florets) with a dip like hummus or salsa, or add a handful of cherry tomatoes to the lunch box. Make them fun to eat.

- Always include a bottle of water with lunch, even if a beverage is included. Other suitable beverages include fat free milk (skimmed) or low fat milk (1%), smoothies made with fat free milk or yogurt, low-sugar flavoured milk or calcium-enriched soy beverages (less than 10% added sugar), yogurt drinks and 100% fruit juice (4-8 ounces daily). Drinking juice or sugary beverages throughout the day can cause tooth erosion and lead to cavities. Sports drinks and diet sodas, although lower in sugar or even sugar-free, can still lead to cavities.

- Choose a soft margarine or a low-calorie spread if needed, or try low fat or fat free mayonnaise and salad dressings.

- Having a healthy lunch does not mean giving up all the foods children enjoy. A slice of coconut bread, banana bread or cassava pone, or a small pack of chips or a couple of cookies can be included in the lunch box as an occasional treat.

- Limit snack items to 100-150 calories (or less) for each serving. See Chapter 6 for more on nutritious snacks.

Appendix 7 lists some sample lunchbox ideas.

Chapter 6

Nutritious Snacks

Snacks are foods and beverages consumed between meals and, if chosen carefully, can contribute important nutrients to the daily diet of all children and young people. Those engaged in high intensity sports do require refuelling after activity and well-chosen snacks can be particularly beneficial.

Although snacks should appeal to the appetite, they should never be selected based on advertising, packaging or taste alone. Many convenience snack foods are high in fat, salt and sugar and these types of snacks should be limited.

Timing of snacks is also important so that they do not interfere with the appetite at meals. Allow at least two hours between snacks and meals. Sugary snacks between meals may be harmful to teeth.

Ideas for nutritious snacks

- Sandwiches made with whole wheat or multi-grain bread or buns, whole wheat pita pockets, flavoured tortilla wraps or roti skins.
- Whole wheat or multi-grain crackers with low fat cheese or peanut butter.
- Whole grain cereals e.g. muesli and oat flakes.
- Plain popcorn or baked chips.
- Unsalted nuts or trail mix (in moderate amounts).
- Yogurt (ultra heat treated or UHT yogurts do not need refrigeration), fat free milk (skimmed) or low fat milk (1%), smoothies made with fat free milk or yogurt, low-sugar flavoured milk or calcium-enriched soy beverages (less than 10% added sugar), yogurt drinks
- Fruit: fresh or canned (in juice or water), snack-size apple sauce
- A handful of cherry tomatoes or vegetable sticks (carrot, sweet pepper, cucumber, broccoli florets) with a dip like hummus or salsa
- Home-baked oatmeal or bran muffins, oatmeal cookies, whole wheat coconut or banana bread, cassava pone or fruit cake. Reduce sugar and fat in recipes (equal quantities of fruit purées like apple sauce or mashed banana can be substituted for margarine or oil in recipes)

Read labels when buying snacks and choose items that contain 100-150 calories (or less) and 10% (or less) saturated fat and sodium per serving. Always check the serving size stated on the package since the container may have more than one serving.

Chapter 7

Breakfast Clubs

Breakfast clubs in schools provide a meal for children and young people who do not have the opportunity to eat breakfast at home. Breakfast menus should be based on the nutrient-based standards outlined in this report with the goal of meeting 30% of the nutritional requirements of children and young people. The Daily Food Guide for planning lunch (Appendix 4) can be adapted and used to plan breakfast.

Children and young people who do not eat breakfast at home may be tempted to eat high-fat, high-sugar snack foods on their way to school or later in the day. Anecdotal evidence from individual schools supports a link between children who have breakfast and improvements in attendance, concentration and achievement.

Ideas for breakfast clubs

Milk used for cereal should be fat free (skimmed) or low fat (1%). Milk or calcium-enriched soy beverages can also be offered.

Yogurts are simple to serve. Choose low fat varieties. Ultra heat treated (UHT) yogurts do not need refrigeration. Yogurt can also be mixed with chopped fruit or cereal.

Breakfast cereals - choose high fibre, low sodium, low sugar varieties more often, such as muesli or oat flakes (read Nutrition Facts labels for information).

Breads – choose whole wheat or multi-grain bread or buns, whole wheat pita pockets, flavoured tortilla wraps or roti skins. Choose breads which are lower in sodium where available.

Crackers – choose whole wheat or multi-grain varieties. Choose those which are lower in sodium.

Toppings for bread and crackers include tuna or sardine (drained), egg (boiled, scrambled, poached, omelette), low fat cheese, ham, hot dogs, corned beef, hamburgers, veggie burgers, lentil patties, baked beans, bean spreads (like hummus) or peanut butter.

Fresh, canned or dried fruit should be included at breakfast. 4-8 ounces of 100% fruit juice can be used as an alternative if fruit is not available. Fruit can be added to cereal and yogurt.

Fresh, frozen or canned vegetables such as lettuce, cucumber, sweet peppers, spinach, carrots and tomatoes may be added to sandwiches or chopped and added to scrambled eggs or omelette.

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Appendix 1

Recommended Dietary Allowances for the Caribbean: Selected nutrients

The table below summarises the Recommended Daily Allowances (RDAs) of selected nutrients for children and adolescents in the Caribbean (7).

Age	Gender	Energy (kcal)	Protein (g)	Vitamin C (mg)	Calcium (mg)	Iron (mg)	Sodium (mg)*
4-6 years	M	1800	22	60	500	10	300
	F	1625	21	60	500	10	300
7-9 years	M	2070	27	60	600	10	400
	F	1825	27	60	600	10	400
10-14 years	M	2450	45	60	700	12	500
	F	2065	45	60	700	15	500
15-18 years	M	2720	57	60	900	12	500
	F	2190	52	60	900	15	500

* Sodium values are minimum requirements; total day's intake should not exceed 2000 mg (6).

Appendix 2

Ways to Encourage Increased Physical Activity in Children and Young People

- **Walking** is an excellent, inexpensive exercise as it requires no special equipment or clothing and can be done regularly by most people. Encourage children and young people to walk whenever possible including to and from school.

- **Cycling** is a popular form of exercise and can be a part of daily activities. (Children should always wear safety helmets when riding and schools may want to consider providing a safe place to store bicycles.)

- **Cricket, football, basketball and tennis** are enjoyed by both girls and boys. Young people of all abilities should be given the opportunity to play in team sports.

- **Swimming** is an excellent and enjoyable form of exercise suitable for both boys and girls. Parents should encourage children to participate in the school swimming programme (where available).

- **Dancing**, in the form of Afro-Caribbean dance, folk dance, salsa and line dancing etc, can be offered to children and young people who are not interested in exercise and sports.

- **Active play** such as skipping, hopscotch or road tennis should be encouraged and facilitated during break, lunchtime or after school.

- **Workout and dance videos** may be preferred by some young people to improve fitness and keep active. These should be available on loan at school libraries for use at home.

- **After-school programmes and clubs** could include active play or sports activities for children and young people.

- **Home chores** such as gardening, raking leaves, car-washing and household chores can all be forms of physical activity.

Appendix 3

The Caribbean Food Groups

Foods eaten in the Caribbean are categorised into six Caribbean Food Groups. Foods within each group tend to be similar in the key nutrients (carbohydrates, protein, fats, vitamins and or minerals) that they contribute to the diet. Choosing a variety of foods from each of the food groups daily is an important first step towards the consumption of a healthy diet.

FOOD GROUP	MAIN NUTRIENTS	EXAMPLE FOODS
STAPLES	Carbohydrate (energy), vitamins, minerals, fibre	Oat flakes, rice, pasta, cou-cou, corn, bread, biscuit, potato, sweet potato, yam, breadfruit, cassava, plantain, green banana
LEGUMES AND NUTS	Protein, carbohydrate, iron, calcium, vitamins, fibre	Dried peas, beans, lentils, nuts, nut butters, soy products (granules, chunks, veggie burgers, tofu, soy beverages), bean dips like hummus
FOODS FROM ANIMALS	Protein, B-complex vitamins, vitamins A and D, iron, fat Milk and dairy also contain calcium and carbohydrate	Meat, chicken, fish (including canned and salted fish), ham, hamburgers, hot dogs, corned beef, eggs, milk, cheese, yogurt
FRUITS	Carbohydrate, vitamin C, beta-carotene, fibre	Banana, pawpaw, mango, guava, cherries, golden apple, sugar apple, soursop, orange, grapefruit, pineapple, 100% fruit juice. Fruit can be fresh, frozen, canned or dried.
VEGETABLES	Vitamin C, beta-carotene, iron, calcium, fibre	Spinach, broccoli, cabbage, string beans, carrots, pumpkin, squash, eggplant, lettuce, cucumber, tomato, 100% vegetable juice. Vegetables can be fresh, frozen or canned.
FATS AND OILS	Fat (energy), vitamin E	Vegetable oils, margarine, butter, shortening, mayonnaise, avocado pear, dry coconut, bacon, meat fat, chicken skin

Appendix 4

Daily Food Guide: Recommended Servings For Lunch

The table below shows the approximate number of servings to be selected from each food group in order to meet 30% of daily requirements for energy for each nutrient standard. Examples of serving sizes for some common foods can be found in Appendix 6, page 26.

ENERGY (calories)	STAPLES	FOODS FROM ANIMALS	FRUITS	VEGETABLES	LEGUMES	FATS AND OILS
580 **Males** **4-9 years** **Females** **4-18 years**	**2**	**1 Dairy*** **AND** **2 other Foods from Animals**	**1**	**1**	**½**	**1-2**
775 **Males** **10-18 years**	**3**	**1 Dairy*** **AND** **3 other Foods from Animals**	**1**	**2**	**1**	**2-3**

Salt should **not** be made available at counters or at tables.
Chilled water should be free and easily accessible throughout the school.
*__Dairy__ includes milk, cheese and yogurt (or calcium-enriched non-dairy substitute).

Appendix 5

Suggested Food-Based Standards for Lunch: Guidelines for Caterers

These are the suggested minimum nutritional standards for school meals in Barbados based on current dietary recommendations and international standards.

PRIMARY SCHOOLS	**SECONDARY SCHOOLS**
At least **one** food from each of the following food groups should be served **daily**:	At least **two** foods from each of the following food groups should be offered **daily** and throughout the lunch period:
• **Staples** such as bread, potatoes, rice and pasta. Staples which are fried should not be served more than **once** a week	• **Staples** such as bread, potatoes, rice and pasta. ○ Staples which are fried, such as French fries, should not be offered more than **once** times a week.
• **Fruits:** Banana, mango, pawpaw	• **Fruits:** Apple, banana, orange, fruit salad.
• **Vegetables:** Carrots, spinach, tomato	• **Vegetables:** Beans, broccoli, carrots, tossed salad. ○ Note that macaroni salad and potato salad are not vegetables.
• **Foods from animals**: Meat, poultry, fish and dairy. Foods from animals which are fried should not be served more than **once** a week. o Dairy should be served daily o Lean red meat should be served at least **twice a week** and oily fish such as tuna should be served at least **once a week**	• **Foods from animals**: Meat, poultry, fish and dairy. ○ Foods from animals which are fried, such as chicken, should not be offered more than **once** a week. o Dairy, such milk, cheese, yogurt, should be available daily. Soy milk is a suitable alternative. o Lean red meat should be offered at least **three times a week** and fish, including oily fish such as tuna, should be offered at least **twice a week**.
• **Legumes:** Dried peas or beans should be served at least **three times a week**	• **Legumes:** Dried peas, beans or nuts should be offered **daily**

Salt should **not** be made available at counters or at tables.
Chilled water should be available.

Appendix 6

Serving Sizes of Some Common Foods

Each example is equal to 1 serving.

Staples

Biscuits, Sodabix/Eclipse/Envita.....3 only
Bread, bun/pita/roll.....½ medium
Bread/toast.....1 slice
Bread, salt bread.....⅓
Breadfruit.....1 slice (1" thick)/2 oz
Cereal, unsweetened ready-to-eat.....¾ cup
Corn, canned.....½ cup/½ large cob
Cornmeal cou-cou.....⅓ cup
Macaroni/spaghetti/chow mein.....⅓ cup
Plantain.....½ small
Porridge/hot cereal (cooked).....½ cup
Potato, English.....½ medium/3 oz
Potato, English, chips.....approx. 10
Potato, English, mashed.....½ cup
Potato, sweet.....½ small/2 oz
Rice/Rice & peas.....⅓ cup
Roti/wrap (10”).....⅓

Fruit

Apple, English.....1 small
Apple, golden.....1 medium
Banana, ripe.....1 small/½ large
Fruit juice (100%).....⅓- ½ cup
Grapes.....14 medium/3 oz
Guava.....1 medium
Mango.....1 small/½ cup
Mixed fruit/fruit salad.....½ cup
Orange.....1 small/medium
Pawpaw.....½ small/1 cup cubed
Raisins.....2 Tbsp
Tangerine.....1 medium
Watermelon.....1 slice, 1” thick/1¼ cup

Foods from Animals

Egg.....1 medium, whole/2 egg whites
Cooked fish/chicken/meat.....1oz
Flying fish.....1 small
Sardines (drained).....1 large/2 small
Tuna (drained).....¼ cup
Chicken, drumstick/wing.....1 small

Dairy

Milk, evaporated (all types).....½ cup
Milk, fresh/pasteurised/low fat.....1 cup
Milk, powder skim/skim.....¼ cup/1 cup
Cheddar cheese.....1oz
Cheese slices (processed).....1½ slices
Yogurt (all types).....6-8 oz

Legumes

Baked beans.....3Tbsp/⅓cup
Cooked peas/beans/lentils.....½ cup
Hummus/bean dip..... /⅓cup
Peanut butter.....1 Tbsp
Soy granules/chunks (dry).....¼ cup

Vegetables

A serving = 1 cup raw or ½ cup cooked

Beets	Broccoli	Cabbage
Callaloo	Carrots	Cucumber
Eggplant	Lettuce	Okra
Pumpkin	Squash	Spinach
String Beans	Sweet pepper	Tomato

Fats & Oils

Margarine/mayonnaise/oil.....1 tsp

Appendix 7

Lunchbox Ideas

Monday

- Rice and peas with chicken
- Carrot and string beans
- Low fat yogurt
- Small bunch grapes
- Water

Tuesday

- Whole wheat bun with tuna, lettuce and cucumber
- Sweet pepper sticks
- Small apple
- 2 small chocolate chip cookies
- Small carton or 1 cup* fat free milk (skimmed), low fat milk (1%) or soy milk (plain or flavoured)

Wednesday

- Whole wheat sandwich with sliced ham, cucumber and tomato
- Carrot sticks
- Small banana
- Small pack nuts or trail mix
- Low fat yogurt drink

Thursday

- Chick pea and vegetable curry
- Whole wheat roti skin or tortilla wrap
- Low fat yogurt
- Tangerine
- Water

Friday

- Macaroni and pumpkin pie
- Fruit salad or fruit cup
- Thin slice of coconut bread
- Small carton or 1 cup* fat free milk (skimmed), low fat milk (1%) or soy milk (plain or flavoured)

Milk or water can be taken to school in a drink bottle

Glossary

Breakfast: The first meal of the day, typically eaten in the morning.

Calorie: A unit which is used to express the amount of heat or energy found in food.

Cholesterol: A fatty waxy substance normally synthesized by the liver and found in animal foods. High levels of cholesterol in the blood increase the risk for heart disease.

Fat free: A fat free product has less than ½ gram of fat in each serving.

Hummus: A dip or spread made from cooked, mashed chickpeas or garbanzo beans.

Hydrogenated or partially hydrogenated oil: Liquid oil that is changed into a semi-solid or solid fat.

Low Fat: A low fat product has 3 grams of fat or less in each serving.

Low Sodium: A low sodium product has less than 140 milligrams in each serving.

Minerals: Substances needed in small quantities which aid in various body functions.

Nutrients: Substances found in food which are needed in adequate amounts for life and the maintenance of health.

Nutrition Facts panel or nutrition label: The part of the food label that gives the serving size, servings per container, calories per serving and information on some nutrients.

Omega 3 fatty acids: A form of unsaturated fat found in oily fish, such as sardine, mackerel and salmon. Omega-3 fatty acids are thought to be beneficial for heart health.

Recommended Dietary Allowance (RDA): The average daily dietary intake level that is sufficient to meet the nutrient requirement of nearly all healthy individuals (98%) in a particular life-stage and gender group.

Serving: A specific portion or amount of food which contributes a standard amount of calories or nutrients.

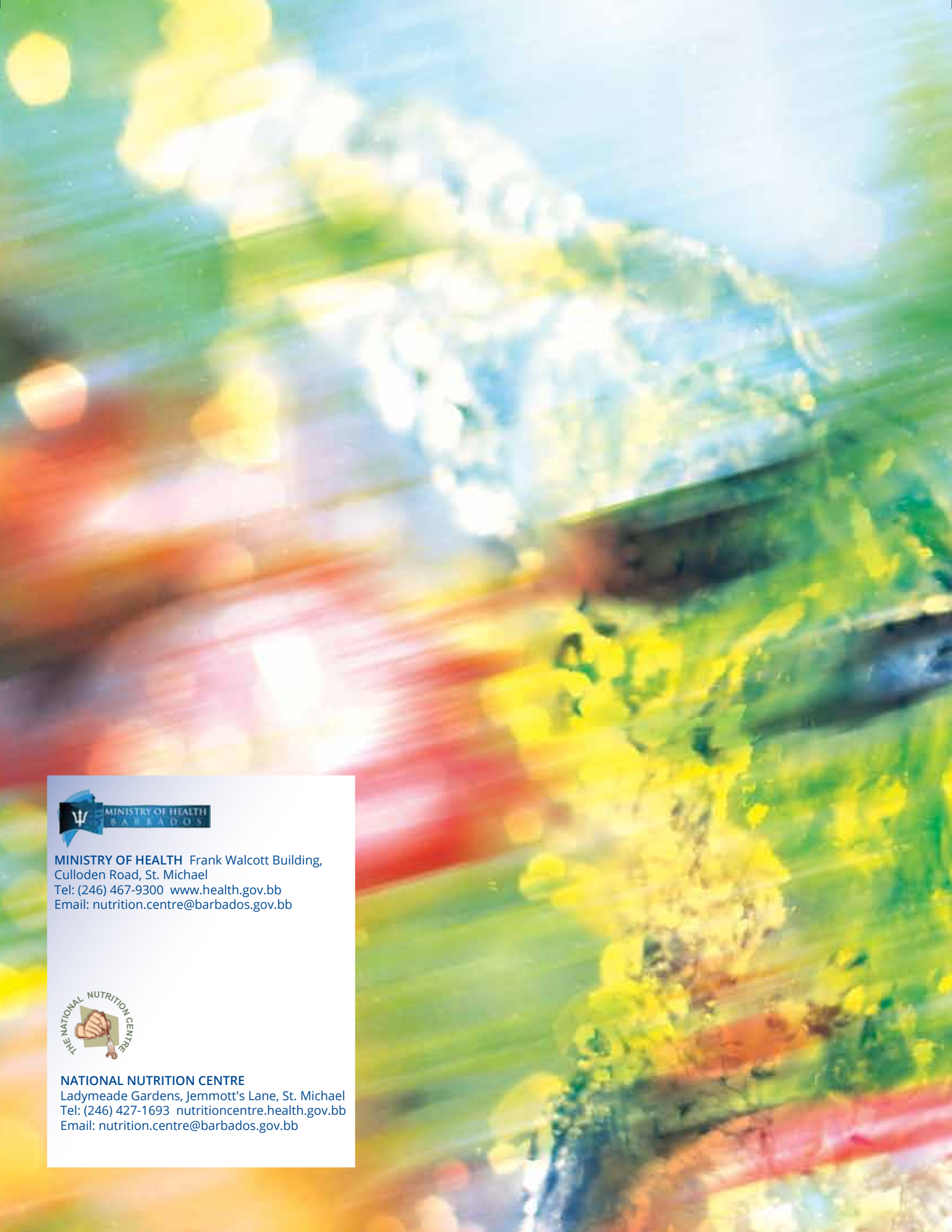
Snack: A small meal; an item of food eaten between meals

Soy Granules: A vegetable source of protein made from soya beans, which when soaked in water resembles ground beef.

Ultra-Heat Treatment (UHT): A method of sterilizing foods (used commercially) to prevent spoilage. UHT milk, yogurt and juices do not require refrigeration until the product is opened.

Vitamins: Substances present in food which are necessary in small amounts to regulate various functions of the body.

Vegetarian: A vegetarian as referred to in this document, is an individual who does not consume fish, poultry or meat.



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