

## MODULE C BACKGROUND INFORMATION

### NURTRITION



#### Background Information

#### Making Healthy Food Choices with *Canada's Food Guide*

The food we eat supplies our bodies with the essential nutrients (carbohydrates, fats, proteins, vitamins, minerals, and water) needed for growth, health, and daily functioning. These fundamental needs change throughout life, from early childhood, through adolescence, and into every stage of adulthood. Nutrient and energy needs are at their highest during the adolescent years. Bone and tissue development during this period, along with the increased blood volume associated with rapid growth, contributes to the increased nutrient and energy needs during adolescence. Meeting these requirements with nutrient-dense foods supports proper growth and development. By learning to make healthy food choices early in life we can decrease the risk of future health problems.

*Canada's Food Guide* describes a pattern of eating (i.e., the type, amount, and quality of food to consume each day) based on changing needs of males and females throughout the life cycle. The eating patterns take into account energy and nutrients required to support growth, as well as calories/energy required at various ages to support healthy weight.

#### *Food Portions*

North Americans suffer from “portion distortion.” A *food portion* (or *serving of food*) is the amount of food an individual chooses to eat. There is no *standard* amount for everyone. For example, a toddler’s food portion will be much smaller than an adult’s portion. An adolescent boy’s serving of food will likely be larger than that of an adult male.

As food portions have increased over the years, consumers have changed their expectations of a *reasonable* serving of food, both at home and away from home. Consequently, we are eating more than ever, without realizing it. It is increasingly important to understand how to use *Canada's Food Guide* effectively.

#### *Food Guide Servings*

*Canada's Food Guide* recommends different numbers of daily Food Guide Servings in each food group for males and females at various ages. A *Food Guide Serving* is a reference amount of food in each food group. It helps people compare how much they eat with what is recommended in *Canada's Food Guide*. Everyone two years of age or older should consume the recommended number of Food Guide Servings each day.

The recommended Food Guide Servings help us plan for and consume the right amount of energy and nutrients throughout the day as meals and snacks. Physical activity increases our energy and nutrient requirements. If we are very active, our extra caloric needs should ideally come from a choice of nutrient-dense foods (i.e., larger portions or a greater number of servings from the four food groups).

### *Foods to Limit*

*Canada's Food Guide* encourages us to limit consumption of foods and beverages that are high in calories, fat, salt, or sugar, or those that do not contain significant amounts of nutrients. No recommended number or size of servings is identified for the diverse category of "foods to limit," which ranges from soft drinks to potato chips. We are encouraged to consume fewer of these "less healthy choices." Foods to limit are not a regular part of the eating pattern identified in *Canada's Food Guide*.

### TEEN PORTIONS

FOOD GROUP	Female	Male
Fruits & Vegetables	7	8
Grains	6	7
Meat & Alternatives	2	3
Milk & Alternatives	3 to 4	3 to 4

### Energy Expenditure

The human body is meant to move. The muscles, bones, heart, and brain improve through regular activities of daily living and exercise. Lack of regular physical activity puts our health at risk.

Decreased physical activity, coupled with an over-consumption of calories, allows the efficient human body to store surplus energy as fat. Any food intake that results in an excess of calories relative to how much the body burns off during the day through physical activity is stored as fat, whether it comes from carbohydrates, fats, or proteins.

Canada is facing an obesity epidemic. Overweight and obese populations in Canada are at increased risk for a variety of chronic health problems, and we are now beginning to see diseases that are found in adults appearing in children as well. Canadians can expect to see increasingly younger people suffering from heart disease, stroke, type 2 diabetes, and joint damage. A 2007 report by Canada's Standing Committee on Health states that "today's children will be the first generation for some time to have poorer health outcomes and a shorter life expectancy than their parents" (*Healthy Weights for Healthy Kids* 1).

## Energy

When we consume plant and animal products, the carbohydrates, fats, and protein (energy-containing macronutrients) are broken down during digestion, releasing energy and nutrients. Some of the energy from these foods is used immediately for various body functions, and some is stored as energy to be used at a later time.

The chemical energy provided by food is ultimately transformed into mechanical energy. *Mechanical energy* is the capacity to do work (e.g., muscle contraction). As the intensity of work increases, energy requirements also increase. For example, if we exercise at low intensity for 10 minutes, the amount of energy expended will be far less than if we exercise at high intensity for 10 minutes. The use of energy during work is referred to as *energy expenditure* (EE).

No energy is lost during the conversion of chemical energy into mechanical energy. For example, the chemical energy of carbohydrates and fats is converted into mechanical energy and heat energy. This process of converting food energy into mechanical work goes on continuously, maintaining the body's life-sustaining processes and keeping body temperature at 37°C. When we exercise, we use the energy in food to make the muscles contract, including the heart, and this requires energy. But since we are not perfectly efficient in converting energy into work, we also create heat. Muscle contraction during exercise increases our body temperature, which often makes us sweat to keep from overheating. During exercise, the energy demands of the body increase dramatically, often resulting in significant increases in body temperature.

## Energy (Calories)

Energy is measured in units called *calories*. Most of the food we eat contains energy, and everything we do (even sleeping) requires energy, resulting in caloric expenditure.

The eating patterns described for males and females of various ages in *Canada's Food Guide* are designed to meet the energy requirements, as well as nutrient needs, of most consumers. This means that individuals who follow the recommended eating patterns will consume an amount of energy that supports healthy weight, even if they are relatively inactive. Maintaining healthy body weight means, in general, that the energy consumed through food is approximately equal to the amount of energy expended. More active individuals should consume more Food Guide Servings to meet increased energy needs.

\* Source: Health Canada. "Interactive Nutrition Label and Quiz." *Food and Nutrition*. 29 Mar. 2006. <[www.hc-sc.gc.ca/fn-an/label-etiquet/nutrition/cons/quiz1-eng.php](http://www.hc-sc.gc.ca/fn-an/label-etiquet/nutrition/cons/quiz1-eng.php)>.

This food item contains 110 Calories in 1 cup or 34 g serving.
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*Energy balance* refers to the relationship between energy in (food consumption) and energy out (physical activity).

- *Positive balance* refers to a situation where energy intake from food exceeds energy expenditure from activity (fat gain).
- *Negative balance* refers to a situation where energy expenditure from physical activity exceeds food intake (fat loss).

In the best scenario, we are able to expend lots of energy from physical activity, and then have to eat sufficient food to balance the energy output. Restricting our food intake when we have low physical activity levels is not a healthy lifestyle.

## **Storing Fat as Energy**

Historically, the body's ability to store energy as fat was extremely useful. Our cave-dwelling ancestors may have spent several days stalking a meal before actually eating it. The energy they stored from consuming the catch of the last hunt was important to sustain them until their next meal.

Fat stores are still important today, as they help us to

- maintain body temperature
- build and maintain body tissue and cells
- protect internal organs
- fuel muscle movement

In our society, however, it is easy to over-consume food and store an excess of energy. In addition, we have systematically reduced physical activity in our daily lives through all the conveniences available to us (e.g., remote controls, elevators and escalators, cars to travel even short distances). This remarkable decrease in daily physical activity is a key factor in the obesity epidemic. An excess of stored energy (body fat), particularly around the abdomen, is associated with increased risk of many diseases.

## **Energy Expenditure**

The human body spends energy for many different purposes, such as life-sustaining metabolic functions, digestion, and physical activity. Regardless of the purpose for which the body spends energy, the energy expenditure will fall within one of the following three categories:

- basal or resting metabolic rate (BMR or RMR)
- thermic effect of food (TEF)
- energy expenditure of activity (EEA)

$$\text{Overall Energy Expenditure} = \text{RMR} + \text{TEF} + \text{EEA}$$

A detailed description of each of these categories follows.

## *Basal or Resting Metabolic Rate*

*Basal or resting metabolic rate* (BMR or RMR) is the amount of energy per minute the body uses to maintain a quiet resting state. This is approximately 1 Cal per minute. Over the course of the day (and night), a person will expend a substantial amount of calories just to maintain the body (1440 minutes in a day  $\times$  1 Cal/min = 1440 Cal per day). Approximately 60% to 75% of the energy used every day is needed to maintain the essential body functions that sustain life. These functions include nervous system activity, breathing, heart function, maintenance of body temperature (thermoregulation), and hormone activity.

BMR and RMR measurements are taken under different conditions:

- **BMR measurements** are typically taken in a darkened room upon waking after 8 hours of sleep and 12 hours of fasting (to ensure that the digestive system is inactive), with the subject resting in a reclining position.
- **RMR measurements** are typically taken under less restricted conditions than BMR measurements, and do not require the subject to spend the night sleeping in the test facility prior to measurement. As a result, RMR has become the more popular measure, and BMR is not often measured anymore.

### **Factors Affecting BMR/RMR**

BMR/RMR, primarily related to lean tissue/fat-free mass, is influenced by a number of factors working in combination, including the following:

- **Age:** Metabolism slows with age (2% to 3% per decade after 30 years of age), primarily due to a loss in muscle tissue due to inactivity, but also due to hormonal and neurological changes.
- **Gender:** Generally, men have a faster metabolism than women because they tend to be larger and have more muscle tissue.
- **Body size:** Larger adult bodies have more metabolically active tissue, which leads to a higher BMR/RMR.
- **Body composition:** Muscle tissue uses more calories than fat, even at rest.
- **Genetic predisposition:** Metabolic rate may be partly determined by genes.
- **Growth:** Infants and children have a higher BMR/RMR related to the energy needs of growth and maintenance of body temperature.
- **Hormonal and nervous controls:** Hormonal imbalances can influence how quickly or how slowly the body burns calories.
- **Environmental temperature:** If temperature is very low or very high, the body has to work harder to maintain a normal temperature; this increases the BMR/RMR.
- **Infection or illness:** BMR/RMR increases if the body has to build new tissue or create an immune response to fight infection.
- **Crash dieting, starving, or fasting:** Eating too few calories encourages the body to conserve through a potentially significant decrease in BMR/RMR. There can also be a loss of lean muscle tissue, which further contributes to reducing BMR/RMR.
- **Physical activity:** Hard-working muscles require extra energy during activity. Regular exercise increases muscle mass, which increases energy consumption, even at rest.
- **Stimulants:** Use of stimulants (e.g., caffeine) increases energy expenditure at rest. However, this is not a healthy way to lose weight.

### ***Thermic Effect of Food***

*Thermic effect of food* (TEF) is the energy required to process the food we eat. Approximately 10% of the calories in a meal are used to digest, metabolize, and store the food just eaten. The energy expenditure is directly related to the size of the meal and the food composition (i.e., the amount of protein, fat, and carbohydrate). Energy is also used for storing carbohydrates and fat as energy in body tissue.

### ***Energy Expenditure of Activity***

*Energy expenditure of activity* (EEA) is the amount of energy needed to fuel body movement as it occurs in activities of daily living, including exercise. Muscle tissue consumes approximately 20% of this energy at rest, but during vigorous exercise, the rate of energy consumption by muscle tissue may go up 50 times or more. Physical activity can have a dramatic impact on a person's daily energy expenditure. During heavy physical exertion (vigorous activity), the muscles may burn as many as 1200 Cal per hour in a very fit individual. An unfit person may only be able to expend 200 Cal per hour. Involuntary movements such as fidgeting and posture control (called NEAT: non-exercise activity of thermogenesis) also contribute to EEA.

Exercise is an extremely important variable in the daily energy expenditure equation and the maintenance of energy balance. Not only is exercise the most changeable component during a 24-hour period, but it is also the one component that is completely under voluntary control (for most people).

In addition to increasing caloric expenditure, exercise has many other benefits, including building more muscle, better bones, and a better heart.

### **The Cost of Being Sedentary**

The rising rates of obesity are due as much to reduced energy expenditure (associated with the Canadian population's decreasing levels of physical activity) as to over-consumption of calories. Canadian adolescents are spending more time on computers, playing video games, and watching television than ever before. The 2007 report of the Standing Committee on Health states: "On average, adolescents in Canada spend almost 35 hours a week in front of a screen, representing more time than in the classroom over the course of the year" (*Healthy Weights for Healthy Kids* 4). Combining classroom and screen time does not leave much time for active living. In fact, in 8- to 18-year-olds, the average amount of time per day spent using media is at least 6 hours and 21 minutes a day (Rideout, Roberts, and Foehr 36). This amount of time does not include time spent sitting in class.

Another report indicates that more than half the young people ages 5 to 17 are not active enough for optimal growth and development (Canadian Fitness and Lifestyle Research Institute). The term *active enough* is equivalent to an energy expenditure of at least 8 kilocalories per kilogram of body mass per day.

*Canada's Physical Activity Guide for Youth* (Public Health Agency of Canada) recommends that young people participate in at least 90 minutes a day of moderate to vigorous physical activity.

It is generally accepted that moderate physical activity expends between 3.5 Cal/min and 7 Cal/min and vigorous physical activity expends over 7 Cal/min. It is important to understand that these are approximations only. An accurate calculation of the energy expended is dependent on the body weight of the individual. If two people completed the same physical activity for the same duration at the same heart rate, the individual with a higher body weight would expend more Cal/min.

Below is an example of approximately how much energy would be expended if an individual were to meet the minimum physical activity guidelines:

- **Moderate physical activity:** 60 min at 6 Cal/min = 360 Cal
- **Vigorous physical activity:** 30 min at 9 Cal/min = 270 Cal

With the addition of 90 minutes a day of physical activity, the total daily energy expenditure can be increased by 630 Cal.

## Energy Balance

*Energy balance* refers to the relationship between energy in (food consumption) and energy out (physical activity).

- *Positive balance* refers to a situation where energy intake from food exceeds energy expenditure from activity (fat gain).
- *Negative balance* refers to a situation where energy expenditure from physical activity exceeds food intake (fat loss).

Almost everything we eat and drink (except water) contains energy in the form of calories. Human beings need energy to maintain body structures and functions, to grow, and to be active. If less energy is spent in activity than is consumed in food, the body is able to store extra calories in the form of body fat. Reduced levels of physical activity and/or over-consumption of food create *energy imbalance*.

The *macronutrients* in food provide the body with calories: carbohydrates and proteins each supply 4 kcal per gram, and fat provides 9 kcal per gram (alcohol provides 7 kcal per gram but should not be considered a positive energy source). The recommended intake for each of these nutrient categories for 14- to 18-year-olds is as follows (Health Canada, *Eating Well with Canada's Food Guide: A Resource for Educators and Communicators 4*):

- **Protein:** 10% to 30% of daily energy intake
- **Fat:** 25% to 35% of daily energy intake
- **Carbohydrate:** 45% to 65% of daily energy intake

## *An Acquired Taste*

Many people like the taste of sugar and the taste and texture of fat. This is why snack foods and fast foods appeal to many people. It is important for both teenagers and adults to be aware of their intake of high fat and/or sugar-laden (empty calorie) foods, and to have a plan to change the level of consumption, if appropriate.

## *Sugar Surprise*

Sugar occurs naturally in food, and it may be added as an ingredient. Health Canada encourages consumers to limit the intake of foods high in sugar, as they are often also a source of *empty calories* in the diet (i.e., energy without nutrients). In addition, individuals with high sugar consumption are more likely to have relatively poor intake of other important nutrients.

Information on food labels helps consumers to identify sugar in food. The Nutrition Facts table on food labels lists both natural and added sugar as *Sugars* under the heading *Carbohydrate* (see example). The Ingredients list on food labels helps distinguish between added and natural sugars. If there are no sugar items on the Ingredients list, no sugar has been added, and any sugar listed under Carbohydrate on the Nutrition Facts label is present naturally in the food (e.g., grains, fruit, milk, legumes). Items on the Ingredients list ending in *ose* (e.g., sucrose, glucose, fructose) are added sugars, as are syrup, molasses, and so on. Ingredients closer to the beginning of a list are present in larger amounts by weight than those appearing later in the list.

In addition to checking food labels for sugar content, look at the Eat Well box on the back of *Canada's Food Guide* for a list of foods to limit, many of which are high in sugar.

Nutrition Facts *		
Per 1 cup (34 g) cereal		
Amount	Cereal	With 1/2 cup 1 % milk
% Daily Value		
Calories	110	170
Fat 0.5 g	1 %	3 %
Saturated 0 g + Trans 0 g	0 %	4 %
Cholesterol 0 mg		
Sodium 290 mg	12 %	15 %
Potassium 180 mg	5 %	11 %
Carbohydrate 27 g	9 %	11 %
Fibre 5 g	20 %	20 %
Sugars 4 g		
Starch 17 g		
Protein 4 g		
Vitamin A	0 %	8 %
Vitamin C	0 %	0 %
Calcium	2 %	15 %
Iron	30 %	30 %

\* Source: Health Canada. "Interactive Nutrition Label and Quiz." *Food and Nutrition*.

[www.hc-sc.gc.ca/fn-an/label-etiquet/nutrition/cons/quiz1-eng.php](http://www.hc-sc.gc.ca/fn-an/label-etiquet/nutrition/cons/quiz1-eng.php).

## **Fat . . . in Moderation**

Fat is an integral part of healthy eating for everyone. It is a source of fat-soluble vitamins (i.e., Vitamins A, D, and E) and essential fats. Fat is part of every cell in the body and helps absorb important nutrients.

Health Canada and the Canadian Paediatric Society encourage a transition from the higher-fat intake of childhood to a pattern of lower-fat eating at the "end of linear growth" or when adult height has been achieved after puberty (Waldron 137). Healthy eating for teenagers should focus on a wide variety of food from all four food groups, with a limited intake of *added fat* (e.g., deep-fried food and snack foods, donuts, pastries, sauces, gravies). For adults, lower-fat eating has been associated with good health.



## Essential Fats

Canada's Food Guide recognizes the importance of consuming *essential fats*. These fats must come from food, as our bodies cannot produce them. They are necessary to manufacture and repair cell membranes throughout the body, especially brain and nerve cells and eyes. Consuming a small amount (30 to 45 mL) of oil, such as canola, olive, or soybean oil, each day (e.g., in stir-fries, salad dressing) ensures a source of these important fats for our bodies.

## Trans Fats

*Trans fats* occur naturally in foods and are created artificially in commercial processing of oils into solid fat through a process called *hydrogenation*. Consuming industrially created trans fats increases the risk of heart disease, as it increases the *bad* low-density lipoprotein (LDL) cholesterol in the blood, and decreases the *good* high-density lipoprotein (HDL) cholesterol in the blood. The report of the Trans Fat Task Force (Health Canada) recommends limiting trans fat consumption.

Nutrition Facts *		
Per 1 cup (34 g) cereal		
Amount	Cereal	With 1/2 cup 1 % milk
% Daily Value		
Calories	110	170
Fat 0.5 g	1 %	3 %
Saturated 0 g		
Trans 0 g	0 %	4 %
Cholesterol 1.0 mg		
Sodium 290 mg	12 %	15 %
Potassium 180 mg	5 %	11 %
Carbohydrate 27 g	9 %	11 %
Fibre 5 g	20 %	20 %
Sugars 4 g		
Starch 17 g		
Protein 4 g		
Vitamin A	0 %	8 %
Vitamin C	0 %	0 %
Calcium	2 %	15 %
Iron	30 %	30 %

\* Source: Health Canada. "Interactive Nutrition Label and Quiz." *Food and Nutrition*. <[www.hc-sc.gc.ca/fn-an/label-etiquet/nutrition/cons/quiz1-eng.php](http://www.hc-sc.gc.ca/fn-an/label-etiquet/nutrition/cons/quiz1-eng.php)>.

## Food Safety

Canada has one of the best and safest food supplies in the world. Food safety is multi-faceted, involving all stages of food handling, from production to distribution. The Canadian government has established an agency that enforces policies and standards, set by Health Canada, governing the safety and nutritional quality of all food sold. The Canadian Food Inspection Agency (CFIA) is authorized to direct industry to remove potentially harmful food products from shelves. The agency also educates the public about the safe storage, handling, and preparation of food.

Despite all the precautions taken to ensure safe food, "public health experts estimate that there are 11 to 13 million cases of food-borne illness in Canada every year," costing over \$1 billion in health care costs, legal fees, and lost wages (CFIA). In most cases, the pathogenic organism is present because the food was not handled or stored properly. Most cases of food-borne illness can be prevented with safe food-handling practices. That is the focus in this lesson.

## Causes of Food-Borne Illness

According to the Centers for Disease Control and Prevention, more than 250 known illnesses can be transmitted through food. Unknown or undiscovered agents cause a high percentage of all food-borne illnesses and related hospitalizations. Many people do not report their illness because they suffer mild symptoms and recover quickly.

Food usually becomes contaminated through improper consumer handling, preparation, or storage (e.g., individuals who do not wash their hands after using the washroom or have infections themselves often cause contamination). Given the right conditions, the harmful organisms can multiply to millions in a very short period of time.

Sickness caused by contaminated food is referred to as *food-borne illness* or *food poisoning*. The organisms that cause food-borne illness are too small to see, they don't smell, and they don't have a taste.

The symptoms of food poisoning range from mild stomach cramps to nausea, vomiting, diarrhea, and fever, which can be life-threatening to very young children, seniors, pregnant women, and people whose immune systems are already weakened.

Some people may become ill after ingesting only a few harmful organisms, while others may remain symptom-free after ingesting thousands.

### ***High-Risk Foods***

All foods can cause food-borne illness, and contamination can occur in the production, processing, or packing of food. Foods that can easily support the growth of harmful organisms are known as *high-risk foods*.

Examples of high-risk foods are

- meat and poultry such as chicken and turkey (raw and cooked)
- fish and seafood
- eggs
- prepared salads such as coleslaw, pasta salads, and rice salads that contain mayonnaise
- dairy products
- cooked rice
- cooked pasta
- prepared fruit salads
- processed meats such as salami and ham

### ***Low-Risk Foods***

Low-risk foods do not require refrigeration until opened. These foods tend to be high in sugar, salt, or acid, and/or low in water content.

Examples of low-risk foods are

- bread and most baked goods
- jam and preserves
- syrups and vinegars
- hard cheese
- peanut butter
- nuts, seeds, and dried fruit
- fresh fruit and vegetables (they can become contaminated after cutting and should always be washed before eating)

## Contamination Protection and Food Safety

Consumers can help protect themselves from food-borne illness by learning more about the growth and spread of organisms/micro-organisms and by practising effective preventive measures.

### ▪ **What do organisms/micro-organisms need in order to grow and multiply?**

Organisms/micro-organisms need the following conditions to multiply:

- **Food:** Food is a basic requirement for growth.
- **Moisture:** Many micro-organisms will not grow in dry food. High salt, acid (vinegar), or sugar content will inhibit growth in moist foods.
- **Temperature:** Optimal temperature for the growth of micro-organisms is between 4°C and 60°C. This temperature range is known as the *food danger zone*.
- **Air:** Most micro-organisms (but not all) require oxygen to grow. Botulism is one exception and thrives in anaerobic environments.
- **Time:** When the above conditions are ideal, micro-organisms can grow rapidly.

### ▪ **How are micro-organisms transferred/spread?**

Micro-organisms may be present naturally in foods or transferred on people's hands, through coughs, other foods, utensils, equipment, water, or pests.

### ▪ **How can the growth of micro-organisms be prevented?**

We can prevent food-borne illness by following these simple steps:

- Prevent micro-organisms from spreading by protecting food from contact with contaminated objects. This includes people, dirty equipment, utensils, and possibly other foods.
- Stop micro-organisms from growing by eliminating conditions that encourage growth. The most effective way to keep micro-organisms from multiplying is to keep food out of the danger zone. Keep cold foods below 4°C and hot foods above 60°C.
- Finally, destroy the micro-organisms. Most micro-organisms cannot survive temperatures above 75°C for 30 seconds. We can make food safe by cooking it. The temperature that makes and/or keeps food safe is also used to sanitize dishes and equipment. Certain chemicals (such as bleach) also kill micro-organisms. These sanitizing agents are the best means to clean countertops and large equipment.

Everyone has a responsibility to help keep food fresh and safe by following safety guidelines related to handling, preparing, cooking, serving, and storing food.

## Advertising and Marketing Strategy Influences on Food Purchases

Television is the primary medium used for food advertising, followed by magazine advertising. Canadian radio and television advertising must comply with the Food and Beverage Clearance Section of Advertising Standards Canada (ASC). Currently, no federal legislation is applied to print advertising for food and beverages (print advertisements may be voluntarily submitted for review to the Canadian Food Inspection Agency's Food Labelling Information Service).

### **Nutrient Content Claims**

Many food labels are now making *nutrient content claims* in response to consumer health concerns. Food packages often make nutrient content claims by including words or phrases such as *0 trans fats*, *light*, *low calorie*, *good source of fibre*, *reduced fat*, and so on. What do these phrases really mean, and are they regulated?

In Canada, manufacturers must include *nutrition facts* on most pre-packaged food. *Nutrient content claims* do not have to appear on food packages; however, when they are included, they generally appear on the front of the food packages to draw attention to a specific aspect of the food. When food packages include nutrient content claims, consumers can be reassured that the claims made meet specific government criteria.

Consumers concerned about healthy eating can examine the Nutrition Facts label and list of ingredients on food packages, as well as explore what the nutrient content claims mean.

### **Marketing Tricks of Grocery Stores**

Ongoing market researchers ensure that purchasing opportunities are maximized when individuals are in grocery stores/supermarkets. Grocery retailers rely on shoppers spending more than they intended, buying more than is on their shopping list, and being convinced to purchase items that appear to be on sale (Stone).

If shoppers are aware of advertising and marketing techniques commonly used by grocery stores/supermarkets, and are well organized and prepared in advance for their grocery shopping, they can better avoid being influenced by marketing tricks.

## **Food and Nutrition Myths and Misconceptions Related to Physical Activity and Sport Performance**

There are numerous myths and misconceptions about food and nutrition related to health and physical activity and sport performance. They result in misunderstandings about the nutrient value of, and the potential benefits or harm derived from, certain foods and fluids.

It is important to understand that the nutritional needs of individuals participating in physical activity will depend on a variety of factors, such as

- the type of physical activity
- the duration of the activity session
- the intensity of the activity
- the age and gender of the participant
- the environment in which the activity takes place (e.g., air temperature, humidity, time between sessions)