Importance of Nutrition

Introduction

In this lesson you will learn about the importance of food choices and their nutritional value throughout various stages of life as well as during pregnancy. This lesson will help you gain knowledge about how to choose different foods to aid in disease prevention.

Why do you choose to eat the foods that you do? Have you ever wondered about the nutritional content of those foods? Have you ever compared what you eat to your parents/guardians or grandparents? Should there be different food choices for various life stages? If so why do you think that?

The nutritional needs of the body change throughout life's stages but the nutritional requirements remain the same.

Food and Life Stages

In general, consume

- Many different nutritious foods
- Six to eight glasses of water daily
- Enough protein to maintain and repair cells
- Vitamins that are fat- and water-soluble
- Essential minerals (ex. iron, calcium, and zinc)
- Limited trans fats, alcohol, caffeine, and salt

Remember: a varied diet that includes only fruits, vegetables, whole grains, dairy foods, and lean meats can fulfil these basic requirements.

Pregnant Women/Fetal Development

Some recommendations for women that become pregnant are:

- Add 300 calories extra per day during the second and third trimester
- Concentrate on quality rather than quantity of the foods you choose.
- Cravings are OK, but don't let them replace more nutritious foods.
- Pay special attention during pregnancy to iron, calcium, folic acid, vitamin C, zinc, and protein. Iron supplements are often advised, but don't take them unless your doctor recommends them. Before and in the early weeks of pregnancy folic acid is important to avoid neural tube defect (birth defects involving incomplete development of the brain and spinal cord) in the baby. All women of childbearing age should eat foods high in folic acid like leafy green vegetables such as kale and spinach, orange juice, and enriched grains or take a folic acid supplement (remember to talk to your doctor first).
- Do not drink any alcohol during pregnancy to avoid a disorder called Fetal Alcohol Syndrome (FAS). FAS is associated with a lower IQ, developmental delays, behaviour problems, learning difficulties, and memory problems.
- Be physically active, swimming is great. Consult your doctor before exercising.

- Keep drinking plenty of fluids
- Direct and passive smoking is risky. Smoking is associated with growth retardation, increased risk of spontaneous abortion, stillbirths, placental complications, and low birth weight.

A baby depends on the food the mother eats to supply energy, protein, vitamins, calcium, iron, and other minerals from the instant of conception for normal growth and development.

Infants: birth to six months of age

Infants may increase their body length by 50% and their weight by 300% between birth and one year of age. Breast milk is a good choice because it supplies a baby with the required amounts of nutrients, fluids, and energy up to six months of age. Where possible, breast milk is preferred to formula (infant formula is an industrial produced milk product, usually based on either cow or soy milk, designed to duplicate the nutrient content of natural human breast milk). Additional advantages of breast milk is that it contains many protective and immunological factors that benefit the baby's development.

Infants: six to twelve months

Around six months of age, solid foods are usually introduced. There may be reduced body stores of iron and vitamins D as a baby is gradually weaned from the breast or bottle and new solids are introduced.

- Expose the skin to sunlight occasionally, enough to provide a baby's vitamin D requirements.
- Introduce foods one at a time so if there is an allergic reactions you know which food caused it.
- Introduce new foods once every four to five days to avoid confusion and to rule out food allergy and sensitivity.
- Introduce cereals as the first solid food (this is frequently recommended). Cereals that are iron enriched rice-based have an additional benefit. There is a lower risk of an allergic reaction which may occur with food such as eggs, dairy products.
- Introduce fruits and vegetables after the cereals. Fruits and vegetables are important for vitamin and mineral content and they also provide new tastes, textures, and colours.
- Offer meat, poultry, and fish last.
- Do not add salt or sugar to your baby's food, they are not important.
- Avoid 2% or skim cow's milk in the first 12 months. Whole milk can be introduced after six months. (For infants under six months, cows' milk protein is hard to digest, the fat is poorly absorbed, and the mineral content is too high.)
- Feed babies frequently – up to four to six times per day.

The first year of an infant's life is a time of astonishing physical change. During this time, a baby will grow rapidly. On average, babies grow 25 centimetres in length while tripling their birth weights by their first birthday.

Childhood

1. Children need nutritious food to fuel growth, development, and active play. A child's early experiences with food helps shape their eating habits later in life. By being good role models, parents and guardians can encourage children to experience and enjoy a wide variety of tasty and nourishing foods.

2. Food-related problems for young children include tooth decay, becoming overweight, becoming obese, and the development of food sensitivities. Recommendations include:
    - Your child needs to have enough fluids, especially milk and water.
    - Some foods are more likely to cause allergic reactions, such as peanuts, shellfish, and cow's milk.
    - Eat close to the recommended portions or food from the food groups as laid out by *Eating Well with Canada's Food Guide*.
    - Eat foods low in fat.
    - Avoid eating or drinking after teeth have been brushed at night.
3. During childhood, children tend to vary their food intake spontaneously to coincide with their growth patterns. Growth spurts and the onset of puberty increase nutritional needs further.

Adolescence

As children experience the growth spurt as they move into adolescence they need additional calories and nutrients. For girls, this generally occurs around 10 to 11 years of age, and boys at around 12 to 13 years. Recommendations include:

- Foods that are high in calories can generally be eaten without causing excess weight, as long as the adolescent is physically active.
- Balance takeaway and fast foods with nutrient-dense foods, such as wholegrain breads and cereals, fruits, legumes, nuts, vegetables, fish and lean meats.
- To boost calcium intake important for growing bones, provide dairy products.

Calcium intake is important at this stage of life as 90% of ones total bone mass is achieved by the age of 17. Getting a significant amount of weight-bearing exercise and Vitamin D will also optimize bone development during adolescence.

By the time girls reach age 15 and boys reach age 16 or 17, the growth associated with puberty will have ended and they will have reached physical maturity.

Young Adults (18 to 30)

Employment, education for your future career, and possibly moving away from home are parts of the changing lifestyle that accompanies the late teens and early 20s. This changing lifestyle may have an impact on making healthy nutritional choices. To help ensure optimum health is maintained through this stage, below are some recommendations.

- Establish healthy eating habits that will be carried on into later life.
- Be conscious of food portion sizes.
- Make a deliberate effort to keep active. (30 to 60 minutes daily of weight-bearing cardiovascular and resistance training activities)
- Limit or ideally avoid alcohol intake.
- Keep your fat intake below 30% of total daily calories. Avoid trans fats.
- Limit the amount of salt in the daily diet.
- Include foods rich in iron and calcium.

Adults

In adulthood, our nutritional needs stabilize, but it's vitally important that we eat a healthy, balanced diet to help avoid health problems like heart disease and type II diabetes.

Although the body has stopped growing and developing, nutritional needs remain high to help keep the immune system high to fight off diseases and illnesses. It is important to know that metabolism (how quickly your body uses up calories) slows down at a rate of approximately 2% per decade. Women need to take special care with iron because menstruation makes their needs higher.

Senior Years (55+)

As people get older their caloric needs may decline due to a drop in muscle tissue which is often a result of less physical activity. However vitamin and mineral needs stay the same and may even increase as the body starts absorbing them less sufficiently. For example, as you get into your senior years the stomach declines in its ability to absorb B vitamins. For this reason many seniors take vitamin b supplements to ensure they have enough B vitamins for neurological function.

Staying as active as possible benefits both body and mind, and allows an ample food intake without unhealthy weight gain. Physical activity also helps to maintain a strong immune system, which reduces risk of illness and speeds recovery. A daily multivitamin and mineral supplement can be helpful as well.

Recommendations for Seniors

- Consider a wide variety of foods and remember to drink adequate fluids.
- Well-balanced eating with regular exercise, keeps you healthy.
- Eat nutrient dense foods, for example, eggs, lean meats, fish, liver, low-fat dairy foods, nuts and seeds, legumes, whole grain breads and cereals.
- Get outside each day to boost your vitamin D synthesis for healthy bones.
- Remember a calorie is a calorie. Eat nutritious calories! Avoid foods that are high in calories and low in nutrients, such as cakes, sweet biscuits, and soft drinks.
- To keep bowels healthy and regular, choose foods naturally high in fibre.
- Table salt needs to be limited, especially during cooking.
- Stimulate your appetite and maintain muscle mass; get active!

Mental Health

A person's food intake affects mood, behaviour, and brain function. A hungry person may feel irritable and restless, whereas a person who has just eaten a meal may feel calm and satisfied. A sleepy person may feel more productive after a cup of coffee and a light snack. A person who has consistently eaten less food than needed over a long period of time may be apathetic and moody.

The human brain has high energy and nutrient needs. Changes in energy or nutrient intake can alter both brain chemistry and the functioning of nerves in the brain. The intake of calories and several different nutrients affect the levels of chemicals in the brain called neurotransmitters. Neurotransmitters transmit nerve impulses from one nerve cell to another, and they influence mood, sleep patterns, and thinking. Deficiencies or excesses of certain vitamins or minerals can damage nerves in the brain, causing changes in memory, limiting problem-solving ability, and impairing brain functions.

Benefits of Healthy Eating

"Poor" diet and physical inactivity are associated with an increased risk of a number of chronic health conditions including cardiovascular disease, type II diabetes, some cancers, osteoporosis, high blood pressure, as well as overweight and obesity. Eating well and regular exercise are preventative benefits.

Nutritional Value of Foods

Introduction

Throughout this lesson you will investigate the nutritional value of different foods as well as learn how to read labels. Making sure you know how to determine the nutritional value of foods will help you to make educated meal and snack choices.

Are You Label Smart?

One of the most important consumer skills is the ability to read and interpret food labels. Knowing how to interpret nutrition facts, nutrition claims, and ingredient lists is the first step in being able to make healthier food choices.

Nutrition Facts

The Nutrition Facts box on food labels is required by law in Canada. Nutrition Facts will assist you in making informed choices when deciding to purchase a packaged food item.

There are four key messages to Nutrition Fact Labeling.

1. All the information in Nutrition Facts is based on specific amount of food.

2. The facts table lists calories and some core nutrients.

3. The % Daily Value (% DV) gives a context to the actual amount of a nutrient. It indicates at a glance how much of a nutrient is in the specific amount of food.

4. This number is the actual amount (quantity) of the nutrient in the specific amount of food. Even if the nutrient amount is zero, it is listed.

Nutrition Facts	
Serving Size 1 cup (228 grams)	
Amount Per Serving	
Calories 260	
Calories from fat 120	
	% DV
Total Fat 13 g	20%
Saturated fat 5 g	25%
Cholesterol 30 mg	10%
Total Carbohydrate 31 g	10%
Dietary fibre 0 g	
Protein 5 g	

Nutrition Claims

Nutrition Claims on the front of food packages describe the amount of a nutrient in a food (ex. a claim that a product is "fat free"). Labelling laws on packages do not require nutrition claims but there are regulations that indicate the wording of a claim to ensure that it is accurate. The Canadian government has defined the meanings of these claims in order for manufacturer's se to highlight certain nutrition claims of a product. Below is a select of the common nutrition claims for fat, "light" products, limiting calories, sugar, and calcium content.

Nutrition Content Claims and Their Meaning*	
Free	• An amount so small, health experts consider it nutritionally insignificant
Sodium free	• Less than 5 mg sodium*
Cholesterol free	• Less than 2 mg cholesterol, and low in saturated fat (includes a restriction on trans fat)* • Not necessarily low in total fat
Low	• Always associated with a very small amount
Low in fat	• 3g or less fat*
Low in saturated fat	• 2g or less of saturated and trans fat combined*
Reduced	• At least 25% less of a nutrient compared with a similar product
Reduced in calories	• At least 25% less energy than the food to which it is compared
Source	• Always associated with a "significant" amount
Source of fibre	• 2g or more fibre*
Good source of calcium	• 165mg or more of calcium*
Light	• When referring to a nutritional characteristic of a product, it is allowed only on foods that are either "reduced in fat or "reduced in energy" (calories) • Explanation on the label of what makes the food "light"' this is also rue of "light" refers to sensory characteristics, such as "light in colour"**

*Per reference amount and per serving of stated size (specific amount of food listed in Nutrition Facts).

**Three exceptions that do not require an explanation are "light maple syrup," "light rum," and "lightly salted", which may be used when a food contains at least 50% less added sodium compared with a similar product.

Ingredient List

All pre-packaged foods must, by law, include a list of ingredients by weight, from most to least important. Those with the most weight are listed first. The ingredients list helps to identify sources of the nutrients and the amount of the ingredient in the food. This list is an important source of information for prevention of food allergies or being aware of products in foods you should not eating for family or cultural reasons.

If you would like further information on food labelling please visit
www.healthcanada.ca/nutritionlabelling

Assignment: Comparing Labels

Name: _____ Date: _____

Find three different snacks foods (such as: chips, peanuts, crackers, etc.) with labels. You can find items in your own house or you may want to visit the local grocery store.

Fill in the following chart to compare your snacks.

Item to Compare	Snack #1 Food Item:	Snack #2 Food Item:	Snack #3 Food Item:
What is the shelf life (best before date)?			
What is the recommended serving size?			
How many servings are in the package or box?			
What are the top five ingredients?			
How many calories per serving size?			
How many grams of fat per serving size?			
List any nutritional claims the product makes. (refer to lesson for some examples)			
What is the % daily value of Carbohydrates?			
What is the % daily value of Cholesterol?			
What are the top three core nutrients in each snack? (refer to lesson if unaware of the 13 core nutrients)			

Assignment: Learning Activity

Name: _____ Date: _____

Answer the following questions.

1. What are some similarities in the three snacks that you chose to compare labels?

2. Which snack would be considered the best for you? Why?

3. When choosing any of these snacks would you then adjust your choice of meals for the day? What are some adjustments you would make?

4. What are some considerations you should look at when choosing a healthy snack?

Factors Affecting Optimal Performance

Introduction

In this lesson you will analyze some of the factors that may affect optimum performance. By putting this last bit of information together with the other knowledge you have already gained, you will be able to make appropriate food and nutritional choices during exercise.

Food and Fuels for Performance

The Manitoba Milk Producers refer to carbohydrates as the "Fuel of Champions." Carbohydrates supply the main source of muscle energy for long, steady, intense activity. Depleted storage of muscle energy leads to reduced endurance, fatigue, and exhaustion. Eating carbohydrates-rich foods is the only way to maintain and refill muscle-energy stores.

All carbohydrates contain roughly the same amount of energy (4 kcal per gram). Foods that are high in carbohydrates include breads, potatoes, pasta, rice, and cereals.

Foods containing carbohydrates can also be rated according to their ability to raise blood glucose levels. This rating is known as the Glycemic Index (GI). As raising the blood sugar levels quickly is not desirable, selecting foods with lower GI's is important for good health. A low on the glycemic index is less than 55, medium is 56 to 69, and high are foods with values of 70 or higher. Foods with a high glycemic index elevate blood sugar (glucose) quicker. White bread, potatoes, and rice are amongst those with a high index. Pasta, noodles, and crisps belong to the moderate index apples, beans, and lentils to the low index.

High GI (70 and above)
Medium GI (56 to 69)
Low GI (55 and under)

The fuel used during exercise is glucose, and muscle glycogen is the stored form of this sugar.

Fats should provide no more than about 20 to 30 percent of daily calories. Your body needs small amounts of fat for certain critical functions and as a supplemental energy source to glucose. But eating too much fat is associated with heart disease, some cancers, and other major problems.

Fats are classified as either saturated or unsaturated. Saturated fats come in foods from animals (ex. meats, eggs, milk, cheese, etc) and unsaturated fats in some vegetable products (ex. corn oil). How your body uses fat for energy depends upon the intensity and duration of exercise.

- When you rest or exercise at low to moderate intensity, fat is the primary fuel source.
- As you increase exercise intensity, your body also relies increasingly on carbohydrates for fuel.
- If your body uses up its glycogen supply and you wish to keep exercising, you will need to decrease the exercise intensity so that your body will go back to fat for energy. During this time your body will try to replenish its glycogen levels.

During exercise, protein plays only a minor role as an energy source. Protein's function is mainly to build, repair, and maintain tissue.

Iron is the mineral in red blood cells responsible for getting oxygen to working muscles. Iron deficiency could lead to anemia. Anemia can cause fatigue and poor recovery from workouts. Foods containing iron include meat, eggs, legumes, dark green vegetables, dried fruit, and enriched grains.

The iron obtained from meat is more readily absorbed than iron from other sources. Consuming meat or a vitamin C-containing food ex. oranges, strawberries, tomatoes) with a non-meat source of iron (ex. legumes, grains) enhances iron absorption, whereas consuming coffee or tea with a non-meat iron-containing food decrease iron absorption.

Be careful in choosing to take iron supplements as high levels of iron consumption can be toxic. Physicians can monitor changes in iron status through comprehensive blood tests.

Food Intake Prior to Competition

As an athlete's training decreases in amount and intensity leading up to a competition, the emphasis on food intake would be on carbohydrates to maximize muscle-energy storage in the form of glycogen.

An athlete/individual should eat nutrient-and carbohydrate-rich foods such as whole grain bread, potatoes, rice, fruit, cereal, legumes, and starchy vegetables. This can be achieved by eating at least eight servings of grain products and vegetables and fruit daily.

Pre-Even Meal

- Eat a meal that consists mainly of food containing carbohydrates and low in protein and fat.
- Drink fluids during a meal.
- Examples of pre-event meals are
    - Cereal, milk, fruit, toast
    - Milk, sandwich with lean meat
    - Fruit, yogurt, muffin
    - Small portion of pasta with tomato sauce

Food Intake Following an Intense Workout

Eating a 200 to 400 gram serving of carbohydrate-rich food (ex. tuna sandwich, chocolate milk, fruit-sweetened yogurt) immediately after exercise, and then small meals spaced evenly throughout the rest of the day, helps to refill the stores of muscle energy or glycogen.

Fluid Loss

Fluids aid in the regulation of body temperature. The evaporation of sweat/perspiration from the skin helps cool the individual's body. Adequate fluid intake helps replace the evaporated sweat/perspiration. Dehydration, associated with not consuming enough fluids to replace the fluids lost during exercise, is serious and can lead to poor performance, cramps, heat exhaustion, and possible heatstroke.

Although water does not provide caloric energy, adequate hydration is at least as important to athletic performance as the food you eat. In fact, fluid losses of as little as 2% of body weight (less than 2kg in

100kg athlete) can impair performance by increasing fatigue. It is common for some athletes to lose between 5 to 8 pounds of sweat during a competition. So it's easy for athletes to become dehydrated if they don't drink enough to replace what is lost in sweat.

Physical activities that are played indoors have conditions of heat, humidity, and airflow differing from those activities played outdoors. Athletes may wear team uniforms and equipment for protection that may not consider heat loss needs. Listed below are some general guidelines for replacing fluid, but make sure to always consider the environment in which you are exercising to be able to make any additional adjustments necessary.

To keep from dangerously overheating, people need to replace fluids as they are lost. To keep pace, the physically active individual should drink.

- At least 625 ml of fluid two hours before a heavy exercise period
- 500ml 10 to 15 minutes before exercise
- 250ml every 15 minutes during exercise

Herbal Supplements

The category "herbal" includes any plant with flavouring or medicinal value. That includes the botanicals we associate with today's pharmaceuticals, as well as the herbal supplements we purchase, and, of course, the herbs we use to enhance the flavor of our food, such as garlic and sage. Today, the practice of a western herbalist primarily draws on 150 to 200 plants.

Because herbal supplements are prompted as all-natural, alternative medicines, consumers tend to think of them more as vitamins than as actual drugs. It is important to understand that herbal supplements do not have to meet federal regulations like other medical drugs do. That means potency, purity, and safety are not necessarily consistent from brand to brand. It's important to talk with your doctor before starting to take any supplement. Listed below are a few important points about herbal supplements and exercise.

- Be aware that labels on herbal supplements can be misleading. In fact there may be substantially more or less of the listed amounts of ingredients in a container. Substances may be added. Failed doping tests for athletes may be caused by these substances.
- Keep up-to-date on the benefits of herbs on performance. Check current references. For example, Ephedra Sinica contains ephedrine, a stimulant to the cardiovascular and nervous system, is used to speed up fat loss and make one feel energetic. However, there is not solid evidence that herbal ephedra can improve athletic performance, but the use of ephedrine-containing products can result in serious die effects, including death.
- Check claims for scientific basis. For example, popular herbs and plants are consumed for their anabolic "muscle building" agents including yohimbine, smilzx, tribulus, wild yams, and gamma oryzanol. The compounds found in many of these herbs and plants, cannot be converted by the human body into testosterone or other anabolic steroids. A claim that these agents can increase muscle mass has little or not scientific basis.