ISS INGREDIENTS: READING FOOD LABELS

FITNESS AND NUTRITION

MISSION DESCRIPTION

In this activity, participants learn how to use food labels and develop an understanding of nutrition facts tables. Participants will help an astronaut, training for an upcoming mission, read and understand serving sizes, percent daily value, and ingredients.

Difficulty: **MODERATE**

Duration: **65-75 MINUTES**

Materials: **MINIMAL**

MISSION PREPARATION

TIMELINE

Breakdown	Duration
Background	15 minutes
Activity	90 minutes
Discussion and questions	15 minutes
Total	**2 hours**

MATERIALS

- Background
- Internet access
- Activity worksheet

SET-UP

- Activity worksheet printed

ACTIVITY 1: INFORMATION ON FOOD LABELS (30 MINUTES)

Participants will navigate "Using food labels" from Canada's Food Guide: https://food-guide.canada.ca/en/healthy-eating recommendations/using-food-labels/

ACTIVITY 2: HELP AN ASTRONAUT USE FOOD LABELS (1 HOUR)

The Participants will complete the attached worksheet.

GOALS

To increase participant ability to use and interpret food labels.

OBJECTIVES

By the end of the lesson, participants will be able to

- Describe how using nutrition facts tables can help you make healthy choices
- Explain how to use serving sizes and daily values

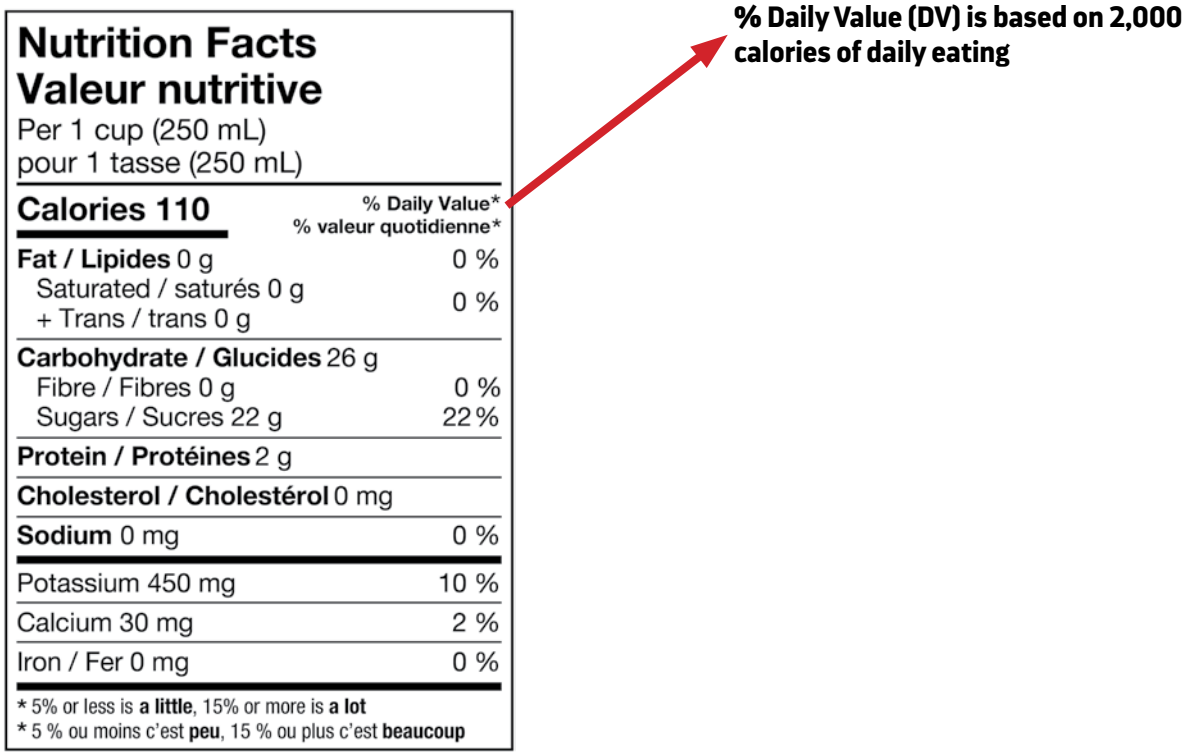
BACKGROUND

Before astronauts go to space for a mission, they spend a lot of time on Earth preparing. To physically prepare for a mission, they need to be healthy and fit. It is important for astronauts to consume healthy, balanced meals which will help power their bodies for training. To choose healthy packaged foods at the grocery store, people can use the nutrition facts tables and read the ingredients list.

RESOURCES

READING NUTRITION FACTS TABLES

The nutrition facts table on a product label provides information on the nutritional content of food and serves as a guide to help you make informed food choices.



Nutrition Facts
Valeur nutritive
Per 1 cup (250 mL)
pour 1 tasse (250 mL)

Calories 110	% Daily Value* / % valeur quotidienne*
Fat / Lipides 0 g	0 %
Saturated / saturés 0 g + Trans / trans 0 g	0 %
Carbohydrate / Glucides 26 g	
Fibre / Fibres 0 g	0 %
Sugars / Sucres 22 g	22 %
Protein / Protéines 2 g	
Cholesterol / Cholestérol 0 mg	
Sodium 0 mg	0 %
Potassium 450 mg	10 %
Calcium 30 mg	2 %
Iron / Fer 0 mg	0 %

* 5% or less is **a little**, 15% or more is **a lot**
* 5 % ou moins c'est **peu**, 15 % ou plus c'est **beaucoup**

On the nutrition facts table, 5% or less of the Daily Value is **a little**, and 15% or more of the Daily Value is **a lot**.

The % DV can help you identify products that are higher in the nutrients you may want more of such as fibre, potassium, calcium, and iron. You can also choose products that are lower in elements you may want less of such as saturated fats and sodium.

Food companies may have nutrient claims on the product label. They may say the product "contains," is a "source of," is a "good source of" or is "high in" a specific mineral or vitamin.

The nutrient claims "contains" and "source of" mean the food provides ≥ 5% of DV per serving of the stated size.

The nutrient claims "good source of" and "high in" mean the food provides ≥ 15% of DV, except for vitamin C which must be ≥ 30% of DV.

READING INGREDIENT LISTS

The ingredient list shows all the ingredients in most packaged foods. Reading the ingredients on a food package can help you avoid allergens and make healthy choices. The ingredients are listed in descending order by weight. In other words, a food contains more of the ingredients found at the beginning of the list and less of the ingredients at the end of the list.

DATES ON PACKAGED FOODS

Dates listed on most packaged foods can help consumers identify the manufacturing/packaged on date, expiry date, or best-before date of the product.

The best-before date indicates the anticipated amount of time that an unopened food product will retain its freshness, taste, texture, and nutritional value. The best-before date can be listed anywhere on the food package. Generally, the month and day are always listed, and the year is optional unless it is needed for clarity. If the year is included, it appears first, followed by the month and day. For example, a food package may have a best-before date listed as "20 JA 30" which means January 30, 2020.

The months listed on the best-before date are shortened. See below for the shorthand version of months listed on a packaged food.

- JA: January
- FE: February
- MR: March
- AL: April
- MA: May
- JN: June
- JL: July
- AU: August
- SE: September
- OC: October
- NO: November
- DE: December

Best-before dates do not indicate if a food is safe to eat. If the best-before date has passed, the product may still be safe to eat. However, it may have lost some of its freshness, flavour, or texture.

A best-before date is not the same as an expiry date. The expiration date is only required on certain foods such as formulated liquid diets, meal replacements, nutritional supplements, and infant formula. When the expiration date has passed, the nutrient content may not be the same as it is declared on the label.

Packaging dates such as "packaged on..." are used on retail-packed foods with a durable life of 90 days or less. This means the food will retain its freshness, etc. until approximately 90 days after packaging.

Astronauts and food scientists providing meals for astronauts use the dates on packaged foods. The packaged foods sent to astronauts on the International Space Station (ISS) for a six-month mission must have a shelf life of one year. This is because the foods are usually sent to the ISS before the astronaut arrives and these foods should retain their freshness, texture, and taste for the duration of the astronaut's mission.

For more information, visit the following pages:

https://food-guide.canada.ca/en/healthy-eating-recommendations/using-food-labels/

https://www.canada.ca/en/health-canada/services/understanding-food-labels/percent-daily-value.html

http://www.inspection.gc.ca/food/requirements/labelling/industry/nutrient-content/specific-claim-requirements/eng/1389907770176/1389907817577?chap=13

http://active.inspection.gc.ca/video/label_eng.html

https://www.canada.ca/en/services/health/food-labels.html

APPENDIX

UNDERSTANDING NUTRIENTS ON THE NUTRITION FACTS TABLE

Carbohydrates are the sugars, starches, and fibre in foods such as vegetables, grains, fruits, and milk. These foods can be healthy or less healthy. Healthy examples include vegetables and fruits, whole grain bread, brown rice, and quinoa. Less healthy examples include doughnuts, sugary cereals, pop, and chips.

Examples of carbohydrates that astronauts can consume on the International Space Station (ISS) include tortillas, multigrain Cheerios, black beans, mashed potatoes, asparagus, and applesauce.

Carbohydrates provide the body with lots of energy in order to function at its best. In particular, carbohydrates supply energy to all body cells and organs.

Read more about the importance of carbohydrates at https://www.canada.ca/en/health-canada/services/nutrients/carbohydrates.html

Proteins are commonly found in foods such as dairy products, meat products, fish, nuts and seeds, and legumes and beans. Proteins are building blocks for bones, muscles, skin, blood, enzymes, hormones, and vitamins. If dietary protein intake is insufficient, growth might be slowed, the immune system may weaken, and kidney and brain functions may be impaired.

Examples of protein-rich foods that astronauts consume on the ISS include baked tofu, beef steak, cashew chicken curry, salmon, scrambled eggs, smoked turkey, and vegetarian chili. In the past, Canadian astronauts have enjoyed Arctic char and bison pemmican.

Read more about the importance of protein at https://www.canada.ca/en/health-canada/services/nutrients/protein.html

Fats obtained from the diet can aid in vitamin absorption, provide energy for the body, maintain cell membranes, and store energy to be used for later. Foods like avocados, nuts, seeds, peanut butter, fatty fish such as salmon, and vegetable oils contain healthy fats (unsaturated fat). High-fat dairy foods (cheese, ice cream, sour cream), oils such as palm and coconut, lard, butter, and fatty cuts of beef, pork, and lamb contain mostly saturated fat and should be limited.

Examples of dietary fat astronauts consume include almonds, almond butter, cashews, extra virgin olive oil, salmon, and cheese.

Read more about the importance of dietary fats at https://www.canada.ca/en/health-canada/services/nutrients/fats.html

Cholesterol is a type of fat made by the body and also found in some foods. Cholesterol can cause harmful effects in the body if it accumulates into plaque in the artery walls.

Read more about cholesterol at https://www.canada.ca/en/health-canada/services/nutrients/cholesterol.html

Sodium is a mineral found in food and in table salt. Sodium is important for nerve transmission and muscle contractions in the body. Sodium can be found in many foods, as it is often added for flavour and/or food preservation. Too much sodium can cause increased blood pressure and bone loss. It is important for astronauts on the ISS and people on Earth to monitor their sodium intake to keep it within the recommended values.

Read more about sodium at https://www.canada.ca/en/health-canada/services/nutrients/sodium/sodium.html

Potassium helps maintain fluid and electrolyte balance and cell integrity. Potassium is important for nerve transmission; keeping bones, kidneys, and muscles healthy; keeping a steady heart rate; and lowering blood pressure. Meeting the potassium intake recommendations can reduce the risks of hypertension, heart disease, and stroke. Sources of dietary potassium include broccoli, carrots, tomato juice, strawberries, squash, artichoke, beans, some nuts, and leafy greens.

Read more about potassium at https://www.unlockfood.ca/en/Articles/Vitamins-and-Minerals/What-You-Need-to-Know-About-Potassium.aspx

Calcium is very important for bone growth and maintenance. If an astronaut or a person on Earth becomes deficient in calcium, they are at a high risk of losing bone mass and of developing bone fractures or breaks. Sources of calcium include milk and dairy products, tofu set with calcium, sardines with bones, broccoli, Brussels sprouts, and cauliflower.

Read more about calcium at https://www.canada.ca/en/health-canada/services/nutrients/calcium.html

Iron is categorized as a mineral and an essential nutrient, which means the body cannot make it so it must be obtained from food. Iron helps produce red blood cells and transport oxygen throughout the body. If astronauts or people on Earth become deficient in iron, they may develop fatigue, headaches, weakness, and become less productive at work or school. Iron can be found in foods such as meat, seafood, eggs, legumes, prunes, and enriched grains.

Read more about iron at https://www.canada.ca/en/health-canada/services/nutrients/iron.html

KEY FOR ACTIVITY WORKSHEET

1. The soup with the lowest amount of sodium is the tomato vegetable soup.

2. Granola bar 3 contains both blueberries and flaxseeds and has the highest content by weight. The flaxseed and blueberry ingredients are higher in the ingredient list than they are in granola bar 1; therefore, granola bar 3 has more blueberries and flax by weight than granola bar 1. Granola bar 2 contains no blueberries.

3. The astronaut arrives at the ISS on December 4, 2019, and stays for a 6-month mission, which means they would leave the ISS around May 2020. The dried fruit should have a best-before date after May 2020. Therefore, the best-before date which would best retain the product's freshness for the astronaut's entire mission is 20 OC 15.

4. The astronaut consumed ¼ cup of black beans in the bowl of chili, which is half the serving on the label. The amount of protein consumed is 4 g.

ACTIVITY WORKSHEET

An astronaut is training for their upcoming mission to the International Space Station (ISS). The astronaut needs to make sure they consume healthy, balanced meals to stay healthy and to feel energized and focused on their training. Help the astronaut choose healthy options at the grocery store by reading the food labels on various packaged foods.

1. The astronaut wants to choose a soup lowest in sodium. Circle the soup that has the lowest amount of sodium out of the three. *Hint: not all soups have the same serving size.*

Tomato vegetable soup

Nutrition Facts / Valeur nutritive	
Per 1 cup (250 mL) / pour 1 tasse (250 mL)	
Calories 60	% Daily Value* / % valeur quotidienne*
Fat / Lipides 1 g	1 %
Saturated / saturés 0.4 g + Trans / trans 0 g	2 %
Carbohydrate / Glucides 10 g	
Fibre / Fibres 1 g	3 %
Sugars / Sucres 3 g	3 %
Protein / Protéines 2 g	
Cholesterol / Cholestérol 0 mg	
Sodium 340 mg	14 %
Potassium 175 mg	4 %
Calcium 20 mg	2 %
Iron / Fer 0.5 mg	3 %

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Vegetable beef with barley soup

Nutrition Facts / Valeur nutritive	
Per 1 cup (250 mL) / pour 1 tasse (250 mL)	
Calories 70	% Daily Value* / % valeur quotidienne*
Fat / Lipides 1.5 g	2 %
Saturated / saturés 0.5 g + Trans / trans 0 g	3 %
Carbohydrate / Glucides 11 g	
Fibre / Fibres 2 g	9 %
Sugars / Sucres 1 g	1 %
Protein / Protéines 4 g	
Cholesterol / Cholestérol 5 mg	
Sodium 520 mg	22 %
Potassium 375 mg	8 %
Calcium 20 mg	2 %
Iron / Fer 0.5 mg	3 %

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Chicken vegetable soup

Nutrition Facts / Valeur nutritive	
Per 1/2 cup (100 mL) / par 1/2 tasse (100 mL)	
Calories 20	% Daily Value* / % valeur quotidienne*
Fat / Lipides 0 g	0 %
Saturated / saturés 0 g + Trans / trans 0 g	0 %
Carbohydrate / Glucides 3 g	
Fibre / Fibres 0 g	0 %
Sugars / Sucres 0 g	0 %
Protein / Protéines 1 g	
Cholesterol / Cholestérol 0 mg	
Sodium 340 mg	14 %
Potassium 30 mg	1 %
Calcium 10 mg	1 %
Iron / Fer 0.25 mg	1 %

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2. The astronaut loves blueberries and flaxseeds and wants to find a granola bar to take to the ISS for their mission that has a high amount of those ingredients. Look at the ingredient lists below and choose a granola bar with the highest content of those ingredients. Explain your reasoning. *Tip: highlight the desired ingredients.*

Granola bar 1	**Granola bar 2**	**Granola bar 3**
Ingredients: Organic whole rolled oats • organic tapioca syrup • organic crisped quinoa • sugars (organic cane sugar, organic sugar, organic honey) • organic dehydrated wild blueberries • organic almonds • organic sunflower oil • salt • organic peanut butter (dry roasted blanched organic peanuts, organic palm oil, salt) • partially ground flaxseeds • natural flavor **Contains:** Peanuts	**Ingredients:** Whole grain oats • dark chocolate pieces (chocolate liquor, cocoa butter, soy lecithin, natural flavor, salt) • canola oil • flaxseeds • rice flour • sugars (sugar, brown sugar syrup) • cocoa • salt • natural flavor • baking soda • soy lecithin **Contains:** Soy	**Ingredients:** Whole grain blend (oats, brown rice, millet, oat flour, buckwheat, amaranth, quinoa) • whole and ground flaxseeds • dehydrated blueberries • blueberry puree • canola oil • sugars (tapioca syrup, dried cane syrup, plum puree, apple juice) • vanilla extract • sea salt • citrus fiber • citrus pectin • natural flavor

3. The astronaut wants to bring dried fruit with no sugar added for their six-month mission on the ISS. Today's date is October 8, 2019, and the astronaut arrives at the ISS on December 4, 2019. Which of the best-before dates below would best retain the product's freshness for the astronaut's entire mission?

   a. 20 AL 10
   b. 20 JA 30
   c. 20 OC 15
   d. 20 MR 5

   Explain why you chose your answer:

4. For dinner, the astronaut is preparing a vegetarian chili with low sodium canned black beans. The astronaut consumes ¼ cup of black beans in one small bowl of chili. Using the nutrition facts table for the canned beans, identify the amount of protein (g) the astronaut receives for **their serving of black beans.**

Nutrition Facts
Valeur nutritive

Per 1/2 cup canned, drained beans (91 g) / par 1/2 tasse de haricots en conserve et égouttés (91 g)

Calories 120	% valeur quotidienne* / % Daily Value*
Fat / Lipides 0.5 g	1 %
Saturated / saturés 0 g + Trans / trans 0 g	0 %
Carbohydrate / Glucides 22 g	
Fibre / Fibres 6 g	25 %
Sugars / Sucres 0 g	0 %
Protein / Protéines 8 g	
Cholesterol / Cholestérol 0 mg	
Sodium 0 mg	0 %
Potassium 325 mg	7 %
Calcium 25 mg	2 %
Iron / Fer 2 mg	11 %

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Protein amount in astronaut's small bowl of chili = _____ g