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# The Development and Use of a Surveillance Tool: The Classification of Foods in the Canadian Nutrient File According to *Eating Well with Canada's Food Guide*



Canada 

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Introduction.....	2
Methods used to establish the CNF/CFG classification .....	3
Step 1. Classifying foods into food groups and subgroups.....	3
Step 2. Classifying foods from the four major food groups into four Tiers .....	6
A. Placement of foods according to Food Guide guidance on fats, sugars and sodium....	6
B. Adjustments according to other Food Guide guidance .....	10
C. Validation and final adjustments to the classification .....	12
Step 3. Assessing and reporting on what Canadians are eating .....	14
Limitations .....	16
Appendix A. Foods from each Tier by food group.....	17
A. Final classification in the Vegetables and Fruit group .....	17
B. Final classification in the Grain Products group.....	18
C. Final classification in the Milk and Alternatives group.....	19
D. Final classification in the Meat and Alternatives group.....	20
E. Other foods and beverages.....	21
Appendix B. Subgroup codes.....	22

# Introduction

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The classification of foods in the Canadian Nutrient File (CNF) according to Canada's Food Guide (CFG or Food Guide) was developed as a surveillance tool to assess the food intakes of Canadians relative to Food Guide guidance (CNF/CFG Classification).

The CNF is the standard reference food composition database for reporting the amount of nutrients in foods people commonly consume in Canada. This nutrition research tool is integral to many activities within Health Canada such as setting policies, establishing standards and regulations, and conducting risk assessment studies and food consumption surveys.

The CNF is used by various groups of stakeholders, other governmental organizations (such as Agriculture and Agri-Food Canada, Canadian Food Inspection Agency, Statistics Canada), institutions (such as hospitals and universities), food manufacturers, and the general public.

Canada's Food Guide defines and promotes healthy eating for Canadians. It describes what amount of food people need and what type of food is part of a healthy eating pattern. The eating pattern in Canada's Food Guide includes foods from each of the four food groups—Vegetables and Fruit, Grain Products, Milk and Alternatives, and Meat and Alternatives—plus a certain amount of added oils and fats.

To assess Canadians' adherence to Canada's Food Guide in terms of amount and type of foods recommended (i.e. number of servings from each food group, and within these, the quality of food choices), a classification system was built—the CNF/CFG classification.

The CNF/CFG classification must be applied to the relevant version of the CNF. Since the classification was developed for surveillance purposes, it was applied to the CNF 2001b version which was used in the last national nutrition survey—the Canadian Community Health Survey Cycle 2.2, Nutrition (CCHS 2004). The results from CCHS 2004 will be used as a baseline for comparison with results from the next national nutrition survey, CCHS 2015. In preparation for CCHS 2015, the classification of foods in the CNF database to be used will be revised according to the same parameters detailed below.

The original CNF/CFG classification was based on the 1992 Food Guide (*Canada's Food Guide to Healthy Eating*). Given the release of *Eating Well with Canada's Food Guide* in 2007, the classification needed to be updated. The revised CNF/CFG classification was developed by a working group, with representation from Health Canada and the Public Health Agency of Canada.

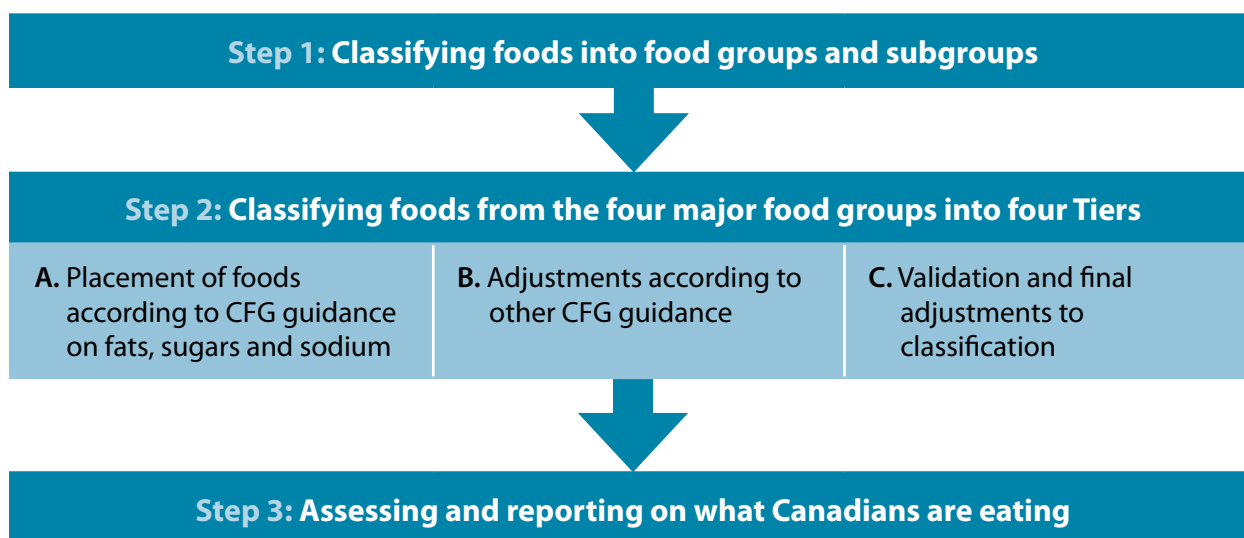
The revised CNF/CFG classification assigns each CNF food to a food group and subgroup. For the four major food groups, it also classifies foods into "Tiers" based on how closely they align with Food Guide guidance. See [Figure 1](#) for an overview of the process undertaken to develop and use the revised CNF/CFG classification.

In this document, the working group describes the method taken to classify foods in the CNF according to the guidance in the Food Guide. This document also describes and provides examples of how nutrition professionals and researchers can use the CNF/CFG classification along with survey data from CCHS 2004 to assess and report on Canadians adherence to the Food Guide.



# Methods used to establish the CNF/CFG classification

Figure 1. Overview of the process undertaken to develop and use the revised CNF/CFG classification



## Step 1. Classifying foods into food groups and subgroups

The first step in establishing the CNF/CFG classification was to assign foods into food groups and subgroups.

Canada's Food Guide encourages people to choose a variety of foods from each of the four food groups—Vegetables and Fruit, Grain Products, Milk and Alternatives, and Meat and Alternatives—and to include a specific amount and type of Oils and Fats.

Foods are classified into food groups based on the following criteria:

- ▶ Foods originating from the same agricultural base;
- ▶ How foods traditionally have been classified;
- ▶ How people use foods (for example, legumes were placed in the Meat and Alternatives group because people often use them as a substitute for meat).

Because the nutrient content of foods within a food group can vary greatly, no specific nutrient criteria were established for classification of foods into food groups.

Within each food group, foods were further classified into subgroups to facilitate surveillance analysis based on amounts and types of foods consumed. For example, dark green and orange vegetables were classified into different subgroups to be able to report on their consumption separately.



Grain products were subdivided into 3 subgroups: whole grain; non whole grain, enriched; and non whole grain, not enriched. Enriched non whole grain was separated from not enriched since the enrichment process restores some of the minerals and vitamins—such as iron and certain B vitamins—to levels that approximate those in the original whole grain.

When the first ingredient in the ingredient list was a whole grain (such as oats, bulgur, quinoa, or millet) the product was considered whole grain. Despite the fact that the germ is often removed in whole wheat flour, products with whole wheat as the first ingredient were also included in the whole grain classification as per the previous CNF/CFG classification.

“Unsaturated fats and oils” are defined as a fat or oil, (for example: salad dressing, margarine or mayonnaise) that has greater than or equal to 50% kilocalories from fat and 2 grams or less saturated and trans fatty acids combined per reference amount. If the fat or oil did not meet these criteria, it was classified in “Saturated and/or trans fats and oils”. Foods that fell outside the four food groups and the Oils and Fats group were classified in “Other foods and beverages not in the food groups of CFG”. See Table 1 on the next page.

**Table 1. Classification of foods into food groups and subgroups**

Food groups	Subgroups	Tiers
Vegetables and Fruit	Vegetables, dark green	Foods within the subgroups are further divided into four Tiers (see Step 2)
	Vegetables, deep yellow or orange	
	Vegetables, potatoes	
	Vegetables, other	
	Vegetables, juice and cocktail	
	Fruit, other than juice	
	Fruit, juice	
Grain Products	Grain products, whole-grain	
	Grain products, non whole-grain, enriched	
	Grain products, non whole-grain, not enriched	
Milk and Alternatives	Fluid milk and fortified soy beverages	
	Other milk alternatives	
Meat and Alternatives	Beef, game and organ meats	
	Other meats (pork, veal, lamb)	
	Poultry	
	Fish	
	Shellfish	
	Legumes	
	Nuts and seeds	
	Eggs	
	Processed meats	
Other foods and beverages recommended in CFG	Unsaturated fats and oils	No Tiers
	Water	
Other foods and beverages not in the food groups of CFG	Saturated and/or trans fats and oils	No Tiers
	Beverages	
	Uncategorized	
	Alcoholic beverages	
	High fat and/or high sugar foods	
Foods and beverages that are not classified	Recipes	No Tiers
	Foods and beverages that are not classified (missing nutrient data)	

## Step 2. Classifying foods from the four major food groups into four Tiers

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Within each of the four major food groups, the Food Guide provides guidance on the type of foods to choose through “directional statements”. The Tiers were devised based on this guidance.

The classification of foods into Tiers consisted of 3 steps:

- A. Placement of foods according to Food Guide guidance on fats, sugars and sodium;
- B. Adjustments according to other Food Guide guidance;
- C. Validation and final adjustments to the classification.

### A. Placement of foods according to Food Guide guidance on fats, sugars and sodium

Canada’s Food Guide encourages people to choose foods lower in fat, sugar and salt. Guidance to support these choices includes:

- ▶ Choose vegetables and fruit prepared with little or no added fat, sugar or salt;
- ▶ Choose grain products that are lower in fat, sugar or salt;
- ▶ Select lower fat milk alternatives;
- ▶ Select lean meat and alternatives prepared with little or no added fat or salt;
- ▶ Limit foods and beverages high in calories, fat, sugar or salt.

This guidance was used as the starting point for the classification of foods into Tiers. To do this, lower and upper thresholds were set for the fats, sugars and sodium content of foods.

The thresholds were based on:

- ▶ The criteria for [nutrient content claims](#);
- ▶ Institute of Medicine (IOM) recommendations on sugars ([Dietary Reference Intakes for Macronutrients](#) and [Nutrition Standards for Foods in Schools](#)).

Nutrient content claims are statements which describe the level of a nutrient in a food. The criteria for most of the nutrient content claims are per “reference amount”. A reference amount (RA) is a specific regulated quantity of a type of food usually eaten by an individual at one sitting. Having criteria for reference amounts provides a uniform basis for claims for any specific category of food.





## FAT AND SODIUM

A food that carries the claim “low in fat” must contain:

- ▶ 3 g or less of fat per RA and, if the RA is 30 g or 30 mL or less, per 50 g of the food.

A food that carries the claim “low in sodium” must contain:

- ▶ 140 mg<sup>1</sup> or less of sodium per RA and, if the RA is 30 g or 30 mL or less, per 50 g of the food.

These criteria were chosen as the lower thresholds for fat and sodium content.

The regulations regarding nutrient content claims also specify that, for most nutrients, the claim “a good source of” or “high in” can be used only when the food provides greater than or equal to 15% of the Recommended Daily Intake (Daily Value) of the nutrient. These claims are generally used for nutrients to encourage in the diet (vitamins and minerals). However, the [Nutrition Facts Education Campaign](#) which is a multi-media campaign that helps consumers understand and use the information on the Nutrition Facts table (in particular, the percentage Daily Value—% DV), uses the 5 % DV and 15% DV as a quick way for consumers to know if a packaged food contains a little or a lot of any nutrient. 5% DV or less is a little, 15% DV or more is a lot.

To be consistent with the regulations and campaign messaging, 15% DV was thus chosen as the upper threshold for fat and sodium content.

## SUGARS

There is no DV for sugars because there is no generally accepted sugars target for a healthy population. Claims for carbohydrate and sugars content are restricted and the claim “low in sugar” is not permitted. The upper and lower thresholds for sugars content were derived in part using recommendations from the IOM.

The IOM report on Dietary Reference Intakes for Macronutrients recommends that 25% or less of total energy intake should be from added sugars. This is based on trends indicating that people with diets at or above this level are more likely to have poorer intakes of important essential nutrients. A daily intake of added sugars that individuals should aim for to achieve a healthy diet was not set.

The IOM recommendation is for added sugars. However, since the CNF does not distinguish between added sugars and sugars naturally present in foods, the IOM’s recommended 25% was applied to total sugars as a proxy DV. The 5% DV and 15% DV were then used to determine the lower and upper thresholds for sugars content.

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<sup>1</sup> The 140 mg value is based on the sodium daily value on the Nutrition Facts table (2400 mg). The working group acknowledges that this criterion will need to be reviewed on a regular basis to maintain consistency with the evolution of the nutritional quality of the food supply and related regulations such as the criteria for nutrient content claims. To remain consistent with the current information contained in the Nutrition Facts table, 140 mg will be used until any updates are made in the regulations.



## CONSIDERATIONS FOR FRUIT PRODUCTS

Since fruit and their juices have a significant amount of naturally occurring sugars, descriptive words in the food name were used as a proxy for the amount of added sugars (e.g. “frozen, unsweetened” was used rather than the thresholds for sugars).

## CONSIDERATIONS FOR FLAVOURED YOGURT AND MILK

Milk products also contain naturally-occurring sugars, and as with fruit, the Working Group determined an approach to primarily consider added sugars content. An alternative threshold for sugars was used for flavoured milks and yogurts.

The working group adopted the following upper thresholds that are suggested by the IOM ([Nutrition Standards for Foods in Schools](#)):

- ▶  $\leq 28 \text{ g}^2$  of sugars per RA for flavoured yogurts;
- ▶  $\leq 22 \text{ g}$  of sugars per RA for flavoured milk beverages.

## SATURATED FAT

The type of fat consumed is as important for health as the total amount consumed. Canada’s Food Guide encourages people to choose lower fat options to reduce the total amount of fat in their diet and reduce the amount of saturated and trans fats they consume.

To reflect this guidance in the classification, the working group incorporated an upper saturated fat threshold. This threshold was derived from the “low in saturated fatty acids” [Nutrient Content Claim](#).

The criteria for making this claim are:

1. The food contains 2 g or less of saturated fatty acids and trans fatty acids combined per RA; and
2. The food provides 15% or less energy from the sum of saturated fatty acids and trans fatty acids.

As shown above, ideally, the threshold should be applied to saturated and trans fat combined. However, the values for trans fat are not widely available for all foods in the CNF. This is partly due to the vast differences in this nutrient between like products. It is also partly due to the pace of reformulation taking place to eliminate trans fats in many products. Therefore only the first condition of the claim was applied (i.e. 2 g or less of saturated fatty acids per RA). In the future, if reliable trans fat data can be obtained for products in the CNF, Health Canada will reassess the criteria for this threshold.

Similarly, in the future, thresholds for other nutrients may also need to be modified based on advances in knowledge and/or changes in the food supply.

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<sup>2</sup> The value of  $\leq 28 \text{ g}$  was obtained after the working group converted the US reference amount for yogurt (250 mL) to the Canadian reference amount of 175 g.



## CONSIDERATIONS FOR MILK AND ALTERNATIVES AND MEAT AND ALTERNATIVES

The Milk and Alternatives and Meat and Alternatives food groups contain more inherent saturated fats than the Vegetables and Fruit and Grain Products food groups. Because of this, the saturated fat threshold was applied somewhat differently. The working group agreed that since the use of the classification is for surveillance purposes, the most appropriate approach was to apply the saturated fat threshold to Tier 1 and Tier 2 only in the Milk and Alternative, and Meat and Alternative food groups.

Table 2 provides a summary of the initial placement of foods in Tiers using thresholds for fats, sugars and sodium.

**Table 2. Initial placement of foods in Tiers using thresholds for fats, sodium and sugars**

Tiers	Fats, sugars and sodium content of foods		Thresholds
1	Foods that <b>do not exceed any of the three lower</b> thresholds for total fat, sugars and sodium <sup>‡</sup>		<b>Lower thresholds:</b> Total Fat: ≤ 3 g/RA** Sugars: ≤ 6 g/RA Sodium: ≤ 140 mg/RA
2	Foods that <b>exceed one or two lower</b> thresholds for total fat, sugars or sodium, <b>without exceeding any upper</b> thresholds		
3	<b>Vegetables and Fruit and Grain Products</b>	<b>Milk and Alternatives and Meat and Alternatives</b>	
	Foods that <b>exceed all three lower</b> thresholds <b>without exceeding any upper</b> thresholds for total fat, saturated fat, sugars or sodium <b>OR</b> Foods that <b>exceed only one upper</b> threshold for total fat, saturated fat, sugars or sodium	Foods that <b>exceed all three lower</b> thresholds <b>without exceeding any upper</b> thresholds for total fat, sugars or sodium* <b>OR</b> Foods that <b>exceed only one upper threshold</b> for total fat, sugars or sodium* <b>OR</b> Foods that <b>only exceed the upper saturated fat</b> threshold	
4	<b>Vegetables and Fruit and Grain Products</b>	<b>Milk and Alternatives and Meat and Alternatives</b>	<b>Upper thresholds:</b> Total Fat: >10 g/RA Sugars: >19 g/RA Sodium: >360 mg/RA Saturated fat: > 2 g/RA
	Foods that <b>exceed at least two upper</b> thresholds for total fat, saturated fat, sugars or sodium	Foods that <b>exceed at least two upper</b> thresholds for total fat, sugars or sodium*	

<sup>‡</sup> Cannot exceed the upper threshold for saturated fat

\* Irrespective of saturated fat content (value may be above or below upper saturated fat threshold)

\*\* RA: Reference Amount



## B. Adjustments according to other Food Guide guidance

In addition to recommending foods lower in fat, sugar and salt. Canada's Food Guide provides other direction on foods to choose within each food group. Guidance to direct people's choices includes:

- ▶ Eat at least one dark green and one orange vegetable each day;
- ▶ Have vegetables and fruit more often than juice;
- ▶ Make at least half of your grain products whole grain each day;
- ▶ Drink skim, 1% or 2% milk each day;
  - ▶ Drink fortified soy beverages if you do not drink milk;
- ▶ Have meat alternatives such as beans, lentils and tofu often;
- ▶ Eat at least two Food Guide Servings of fish each week;
- ▶ Include a small amount of unsaturated fat each day;
- ▶ Satisfy your thirst with water.

This additional guidance was incorporated into the classification to perform adjustments after the thresholds for fats, sugars and sodium were applied. For example, because the Food Guide encourages the consumption of fish, particularly fatty fish, adjustments were made for fish naturally high in fat. Table 3 summarizes these adjustments.

**Table 3. Integrating the other CFG guidance into the classification**

Food Group	CFG Guidance in addition to choosing foods lower in fat, sugar and salt	Additional adjustments after applying thresholds for fat, sodium, sugars and saturated fat
<b>Vegetables and Fruit</b>	Eat at least one dark green and one orange vegetable each day	Orange and green vegetables are identified within the CNF/CFG classification using different subgroup codes. See <a href="#">Subgroup codes</a> .
	Have vegetables and fruit more often than juice	All 100% fruit “juices” or “vegetable juice cocktail” including low sodium vegetable juices are placed in Tier 2 because they have higher sugars content per typical serving than whole fruit.
<b>Grain Products</b>	Make at least half of your grain products whole grain each day	After applying the thresholds, whole grains with naturally-occurring oils that exceed the lower threshold for fat are adjusted from Tier 2 to Tier 1 (if the lower threshold for sugars and sodium and upper threshold for saturated fat are not exceeded).
		After applying the thresholds, <b>non</b> whole grain products that are <b>not</b> enriched but fall into Tier 1 are adjusted to Tier 2 since their loss of vitamins and minerals are not restored to levels that approximate those in the original whole grain.
<b>Milk and Alternatives</b>	Drink skim, 1%, or 2% milk each day (Drink fortified soy beverages if you do not drink milk)	After applying the thresholds, skim, 1% and 2% M.F. milk and fortified soy beverages (plain) are adjusted up one Tier (e.g. from Tier 2 to Tier 1).
<b>Meat and Alternatives</b>	Have meat alternatives such as beans, lentils and tofu often	After applying the thresholds, adjustments are made for legumes, nuts and seeds, nut butters, tofu and other soybean products that fall in Tier 2 or 3 only because of naturally occurring oils (i.e. exceed lower or upper threshold for fat). These foods are moved up one Tier (e.g. from Tier 3 to Tier 2) if they do not exceed the lower thresholds for sugars and sodium and the upper threshold for saturated fat.
	Eat at least two Food Guide Servings of fish each week	After applying the thresholds, adjustments are made for fish that fall in Tier 2 or 3 because of their naturally occurring oils (i.e. exceed lower or upper threshold for fat). They are moved up one Tier (e.g. from Tier 3 to Tier 2) if they do not exceed the lower thresholds for sugars and sodium. They may exceed the upper saturated fat threshold.

See [Appendix A](#) for examples of the types of foods within each of the four Tiers in each of the food groups.

## C. Validation and final adjustments to the classification

The validation exercise builds on the modeling process used to develop Canada's Food Guide (Katamay et al, 2007). Five hundred simulated diets were created based on popular food choices (as reported in CCHS 2004) for each of the Dietary Reference Intake (DRI) age and sex groups. The working group considered the process used to develop the Food Guide and concluded that the diets created using foods from Tier 1 and 2 only were similar to the modeling results for the development of the 2007 Food Guide. The simulated diets made up of Tier 1 and Tier 2 foods were assessed against the DRIs and the reference Estimated Energy Requirements (EER). Adjustments to the classification were made to meet the criteria used to assess simulated diets in the development of the Food Guide (See Table 4, step 4) and to ensure the classification reflected CFG dietary guidance.

The process used to conduct the validation of the classification is described on the next page in Table 4.

**Table 4. Process and brief description of the CNF/CFG classification validation**

	Process	Brief description
1	<b>Create a pool of food choices.</b>	Foods classified in Tier 1 and Tier 2 in the CNF/CFG classification were assigned to the modeling groups used in the development of the Food Guide (see <a href="#">Katamay et al, 2007</a> for the modeling groups used in the food intake pattern).
2	<b>Determine popularity of foods in each modeling group.</b>	Food intake data from the 2004 nutrition focus survey (CCHS 2004) was used to determine the relative popularity of individual food choices in each age and sex group.
3	<b>Create 500 simulated diets for each of the 16 age and sex groups based on the pattern of eating in the Food Guide.</b>	Simulated diets are created with probability of selection of any individual food based on its relative popularity. OUTPUT: Nutrient (and energy) content distributions for each age and sex group.
4	<b>Evaluate the nutrient content distributions of the simulated diets against the appropriate Dietary Reference Intake nutrient standards. Also evaluate energy content against the reference Estimated Energy Requirements (EER) values used in the development of the Food Guide.</b>	<p>The criteria used to assess simulated diets in the development of the Food Guide were applied.</p> <ul style="list-style-type: none"> <li>▶ Low prevalence (less than 10%) of diets with nutrient content less than the Estimated Average Requirement (EARs).</li> <li>▶ 80% of simulated diets should have macronutrient content within the Acceptable Macronutrient Distribution Range (AMDR).</li> <li>▶ The median energy content of simulated diets should be at or below EERs for individuals with a sedentary level of activity.</li> <li>▶ The new EARs for calcium and vitamin D were used instead of the previous Adequate Intakes.</li> </ul>
5	<b>Adjust the classification as needed to improve undesirable results.</b>	<ul style="list-style-type: none"> <li>▶ The classification was reexamined to determine potential reasons why the diets were not meeting all criteria of step 4. Possible adjustments were explored to better reflect CFG guidance.</li> <li>▶ For example, adjustments were made to the classification of some foods in the Milk and Alternatives group to improve calcium, magnesium and zinc content of the simulated diets.</li> </ul>
6	<b>Conduct validation modeling again until satisfactory results obtained.</b>	▶ Steps 1 through 5 of the validation process were repeated until satisfactory results were obtained.

### Step 3. Assessing and reporting on what Canadians are eating

Table 5 is a summary of the description of the Tiers. It explains how to use the classification to report on what Canadians are eating relative to Food Guide guidance.

**Table 5. Description of Tiers and how to report using the CNF/CFG Classification**

Tiers	Description	Explanation	When reporting on food group intakes
1 and 2	<b>“Foods in line with CFG guidance”</b>	Foods that are in line with the guidance in CFG. <b>Most</b> choices should come from this category of foods.	Count towards total number of Food Guide Servings
3	<b>“Foods partially in line with CFG guidance”</b>	Foods that are higher in fat, sugar or salt. On average, <b>few</b> choices should come from this category of foods.	Count towards total number of Food Guide Servings
4	<b>“Foods not in line with CFG guidance”</b>	Foods that are not in line with the guidance in CFG. Foods to <b>limit</b> .	Do not count towards the total number of Food Guide Servings

Foods in Tier 1 and Tier 2 are grouped as “Foods in line with CFG guidance”. Both Tiers include the types of food recommended in the Food Guide, and are lower in fat, sugar and salt. Choosing a combination of foods from Tier 1 and Tier 2, while following the Food Guide pattern, will promote health and reduce the risk of nutrition related chronic disease.

In contrast, foods in Tier 3 are higher in fat, sugar or salt. Since the Food Guide promotes food choices lower in fat, sugar and salt, Tier 3 foods are described as “Foods partially in line with CFG guidance”.

Foods in Tier 4 are described as “Foods that are not in line with CFG guidance”. These foods should be limited in the diet.

Users of CNF 2001b database will notice that foods from Tier 4 do not have “Food Guide Servings” (FGS) since these foods are not in line with CFG guidance. For Tier 4 foods, the working group decided to establish quantities that are equivalent to FGS but are called simply “servings”. The term “servings” are used to distinguish from FGS which will be reported in data analysis and to avoid misunderstanding of Tier 4 foods that are not part of the foods in line or partially in line with CFG recommendations.

Table 6 and Figure 2 below illustrate how to use the classification to assess and report food intake data from nutrition surveys.



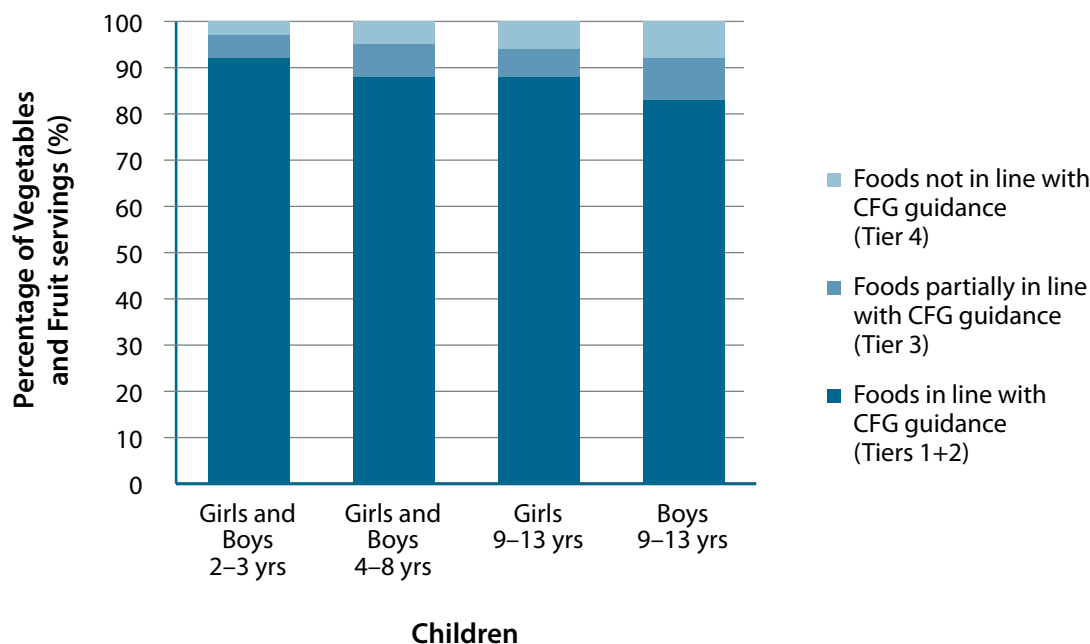
**Table 6. Vegetables and Fruit Food Guide Servings (FGS):  
Usual intakes consumed per day by children in Canada, 2004**

Sex	Age (yrs)	n	Mean number of FGS (Tiers 1–2–3)	Percentage (%) of population consuming (range of FGS)							CFG recommended usual intake
				<2	2–<3	3–<4	4–<5	5–<6	6–<7	7+	Number of FGS
Girls and Boys	2–3	1430	4.2	8.4 <sup>E</sup>	18.3	24.4	20.5	13.2	7.5	7.8 <sup>E</sup>	4
	4–8	3235	4.2	9.1 <sup>E</sup>	18.6	24.8	19.8	13.0	7.6	7.2 <sup>E</sup>	5
Girls	9–13	1980	4.4	<sup>F</sup>	15.8 <sup>E</sup>	25.0	23.7	15.8	8.5 <sup>E</sup>	6.9 <sup>E</sup>	6
Boys	9–13	2080	4.5	6.7 <sup>E</sup>	16.5	22.1	20.3	14.7	9.2	10.5 <sup>E</sup>	6

<sup>E</sup> Interpret with caution, data with a coefficient of variation between 16.6 and 33.3%.

<sup>F</sup> Not reportable; Data with a coefficient of variation greater than 33.3% with a 95% confidence interval not entirely between 0 and 3%.

**Figure 2. Percentage of Vegetables and Fruit servings coming from “Foods in line with CFG guidance”, “Foods partially in line with CFG guidance” and “Foods not in line with CFG guidance”, in children, based on one 24h recall.**



## Potential interpretation

Although the recommended number of Vegetables and Fruit FGS increases throughout childhood, Table 6 shows that intakes remained relatively constant across age groups (with most children consuming around 3 to 5 FGS of Vegetables and Fruit that are in line and partially in line with CFG guidance).

Even though the recommended number of FGS are recommended usual intakes and not minimum amounts, within each age/sex group, a large percentage of children were consuming below the Food Guide's recommended usual intake (Table 6).

Regarding the type of food consumed, the quality of the food choices in this food group was good. Among all Vegetables and Fruit, children predominantly consumed "Foods in line with CFG guidance", as illustrated in Figure 2. Figure 2 presents quality of food choices made within the Vegetables and Fruit food group, i.e. foods in line, partially in line and not in line with CFG guidance.

## Limitations

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Nutrient values are constantly being updated in the CNF. This makes it difficult to establish a classification with a database of evolving nutrient profiles. Since the classification was for surveillance purposes, the working group chose to classify the foods in the CNF database used for the CCHS 2004 nutrition survey—CNF 2001b. In preparation for the next national nutrition survey in 2015, the classification of foods in the CNF database to be used will be revised according to the same parameters.

Because of missing values for some foods in the CNF, saturated fat and total sugars values were at times borrowed from similar foods in the 2001b database. This allowed the foods with missing values to be included in the classification. When it was not possible to borrow values from similar foods in the 2001b database, values were borrowed from the current CNF database (internal application; unpublished version) but only if there was a justifiable reason to assume that the value had not significantly changed over time. If it was not possible to obtain a borrowed value, foods were assigned a code indicating the food could not be classified (9999 subgroup code). Less than 2% of the foods reported in CCHS 2004 were assigned this 9999 code (see [Appendix B. Subgroup codes](#)).

# Appendix A. Foods from each Tier by food group

Following the validation exercise, the classification of foods within each food group was finalized. See below for examples of the types of foods within each of the four Tiers in the food groups.

## A. Final classification in the Vegetables and Fruit group

### Tier 1

Fresh, frozen, dried, canned or cooked vegetables and fruit prepared with little or no added fat, sugars and sodium

- ▶ “frozen, unsweetened” or “dried, unsweetened”
- ▶ Canned, “low sodium”
- ▶ Canned in “water pack”, “juice packed” or “extra light syrup pack”

### Tier 2

Fresh, frozen, dried, canned or cooked vegetables and fruit and their juice prepared with some added fat, sugars and sodium

- ▶ Most vegetables that are “boiled, drained, with salt”
- ▶ “cooked, sugar added”, or “stewed, sugar added”
- ▶ “dried, sweetened” or “dried, cooked/stewed, added sugar”
- ▶ Canned in “light syrup pack” or “syrup” pack
- ▶ Fruit “juice” or low sodium vegetable “juice cocktail”

### Tier 3

Fresh, frozen, dried, canned or cooked vegetables and fruit that are high in either total fat, saturated fat, sugars or sodium

- ▶ Canned in “heavy syrup pack” or “extra heavy syrup pack”
- ▶ Includes those naturally high in fat such as avocado
- ▶ Fruit “nectar” or “juice, sugar added”
- ▶ “frozen, sweetened” or “frozen, cooked, sugar added”
- ▶ Vegetable “juice cocktail”

### Tier 4

Fresh, frozen, dried, canned or cooked vegetables and fruit that are high in two or more of total fat, saturated fat, sodium

- ▶ Most deep-fried or battered and fried foods
- ▶ Snack foods high in fat, saturated fat and/or sodium

## B. Final classification in the Grain Products group

### Tier 1

Whole grain and enriched non whole grain products that contain little or no added fat, sugars and sodium

- ▶ Whole grains low in sodium and sugar such as amaranth, buckwheat, bulgur, millet, oats, kamut, quinoa, brown or enriched rice, sorghum, whole wheat or enriched pasta, some cereals, a few low sodium breads, popcorn

### Tier 2

Whole grain products and non-whole grain products that contain some added fat, sugars and sodium

- ▶ Most breads, tortillas
- ▶ Couscous
- ▶ Some breakfast cereals
- ▶ Some granola bars, crackers and muffins

### Tier 3

Whole grain products and non-whole grain products that are high in either total fat, saturated fat, sugars or sodium

- ▶ Some breakfast cereals, granola bars, cakes, cookies, crackers, breads, biscuits, muffins

### Tier 4

Whole grain and non-whole grain products that are high in two or more of total fat, saturated fat, sugars, sodium

- ▶ Most cakes, cookies, pastries, doughnuts
- ▶ Some crackers and grain-based snacks
- ▶ Some breakfast cereals

## C. Final classification in the Milk and Alternatives group

### Tier 1

Milk and alternative low in fat, saturated fat, sugars and sodium

- ▶ Skim and 1% M.F.\* milk
- ▶ A few reduced fat (<0.5 % M.F.) and reduced sodium cheeses

### Tier 2

Milk and milk alternatives that contain some fat, sugars and sodium

- ▶ 2% M.F. milk
- ▶ A few fortified plant-based beverages
- ▶ A few low fat and low sugar yogurts
- ▶ A few low fat cheeses
- ▶ Some puddings made with milk (<2% M.F.)

### Tier 3

Milk and alternatives high in either total fat, sugars and sodium

- ▶ Whole milk
- ▶ Most flavoured milks (such as 1% M.F. chocolate milk)
- ▶ Most milk-based desserts and puddings
- ▶ Most cheeses

### Tier 4

Milk and alternatives high in two or more of total fat, sugars, sodium

- ▶ Some cheeses
- ▶ Some milk-based desserts

\* M.F. = Milk fat

## D. Final classification in the Meat and Alternatives group

### Tier 1

Meat and alternatives low in fat, sugars and sodium

- ▶ Legumes low in sodium
- ▶ Plain tofu and soybean products
- ▶ Lean meats and poultry
- ▶ Most baked or broiled fish
- ▶ Some plain nuts, seeds and soy products low in saturated fat

### Tier 2

Meat alternatives with some fat, sugars and sodium

- ▶ Some higher fat fish and seafood (naturally occurring oils)
- ▶ Some plain nuts, seeds and soy products low in saturated fat
- ▶ Most eggs

### Tier 3

Meat alternatives high in either total fat, sugars or sodium

- ▶ Most nuts, seeds and peanut butter
- ▶ Most canned legumes<sup>3</sup> and boiled legumes with salt
- ▶ Meats high in fat or sodium
- ▶ Some seafood
- ▶ Some deli meats

### Tier 4

Meat and alternatives high in two or more of total fat, sugars, sodium

- ▶ Most deep-fried or battered and fried meat and alternatives
- ▶ Some deli meats and most sausages
- ▶ Sweetened, canned baked beans

<sup>3</sup> All canned legumes fell into Tier 3 because the products in the CNF include the liquid and as such are high in sodium. The nutrition information for drained, rinsed, canned legumes is not currently available in the CNF.

## E. Other foods and beverages

In the CNF, foods that fell outside the four food groups and the “Oils and Fats” group were classified in “Other foods and beverages not in the food groups of CFG”. Based on the previous CNF classification, these foods were further classified into subgroups for surveillance analysis:

- ▶ Saturated and/or trans fats and oils
- ▶ High fat and/or high sugar foods (e.g. foods high in sugar and/or fat that could not be assigned to one of the food groups, such as candies, chocolate, syrups, sauces, etc... as well as high fat/sugar foods that are usually eaten in small quantities i.e. not large enough to contribute to a Food Guide Serving)
- ▶ Beverages, high calorie ( $\geq 40$  kcal/100g)
- ▶ Beverages, low calorie ( $< 40$  kcal/100g)
- ▶ Uncategorized (e.g. unprepared mixes, dehydrated and condensed soups, spices and herbs, condiments, foods that are usually eaten in small quantities i.e. not large enough to contribute to a Food Guide Serving)
- ▶ Alcoholic beverages
- ▶ Meal replacements and supplements

# Appendix B. Subgroup codes

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## Subgroup codes used in the CNF

### 1000 VEGETABLES AND FRUIT

#### Fruit, other than juice

- 1121 Tier 1
- 1122 Tier 2
- 1123 Tier 3
- 1124 Tier 4

#### Fruit, juice

- 1131 Tier 1 (N/A)<sup>4</sup>
- 1132 Tier 2
- 1133 Tier 3
- 1134 Tier 4

#### Vegetables, dark green

- 1211 Tier 1
- 1212 Tier 2
- 1213 Tier 3
- 1214 Tier 4

#### Vegetables, deep yellow or orange

- 1221 Tier 1
- 1222 Tier 2
- 1223 Tier 3
- 1224 Tier 4

#### Vegetables, potatoes

- 1231 Tier 1
- 1232 Tier 2
- 1233 Tier 3
- 1234 Tier 4

#### Vegetables, other

- 1241 Tier 1
- 1242 Tier 2
- 1243 Tier 3
- 1244 Tier 4

#### Vegetables, juice and cocktail

- 1251 Tier 1 (N/A)<sup>4</sup>
- 1252 Tier 2
- 1253 Tier 3
- 1254 Tier 4

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<sup>4</sup> As per classification, juices do not have a Tier 1



## 2000 GRAIN PRODUCTS

### Grain products, whole grain

2101	Tier 1
2102	Tier 2
2103	Tier 3
2104	Tier 4

### Grain products, non whole grain, *enriched*

2201	Tier 1
2202	Tier 2
2203	Tier 3
2204	Tier 4

### Grain products, non whole grain, *not enriched*

2301	Tier 1 (N/A) <sup>5</sup>
2302	Tier 2
2303	Tier 3
2304	Tier 4

## 3000 MILK AND ALTERNATIVES

### Fluid milk and fortified soy-based beverages

3101	Tier 1
3102	Tier 2
3103	Tier 3
3104	Tier 4

### Other milk alternatives (cheese, yogourt)

3201	Tier 1
3202	Tier 2
3203	Tier 3
3204	Tier 4

## 4000 MEAT AND ALTERNATIVES

### Beef, game and organ meats

4101	Tier 1
4102	Tier 2
4103	Tier 3
4104	Tier 4

### Other meats (pork, veal, lamb)

4201	Tier 1
4202	Tier 2
4203	Tier 3
4204	Tier 4

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<sup>5</sup> As per classification, non whole grain products that are not enriched do not have a Tier 1



## **Poultry**

- 4301 Tier 1
- 4302 Tier 2
- 4303 Tier 3
- 4304 Tier 4

## **Fish**

- 4401 Tier 1
- 4402 Tier 2
- 4403 Tier 3
- 4404 Tier 4

## **Shellfish**

- 4901 Tier 1
- 4902 Tier 2
- 4903 Tier 3
- 4904 Tier 4

## **Legumes**

- 4501 Tier 1
- 4502 Tier 2
- 4503 Tier 3
- 4504 Tier 4

## **Nuts and seeds**

- 4601 Tier 1
- 4602 Tier 2
- 4603 Tier 3
- 4604 Tier 4

## **Eggs**

- 4701 Tier 1
- 4702 Tier 2
- 4703 Tier 3
- 4704 Tier 4

## **Processed meats**

- 4801 Tier 1
- 4802 Tier 2
- 4803 Tier 3
- 4804 Tier 4

## **7000 OTHER FOODS AND BEVERAGES RECOMMENDED IN CFG**

- 7100 Unsaturated fats and oils
- 7200 Water

## **5000 OTHER FOODS AND BEVERAGES NOT IN THE FOOD GROUPS OF CFG**

- 5100 Saturated and/or trans fats and oils
- 5400 Beverages
  - 5410 Higher calorie ( $\geq 40$ kcal/100g)
  - 5420 Lower calorie ( $< 40$ kcal/100g)
- 5500 Uncategorized: Ingredients, seasonings and unprepared foods (e.g. unprepared mixes, dehydrated and condensed soups, spices and herbs, condiments, foods that are usually eaten in small quantities i.e. not large enough to contribute to a Food Guide Serving)
- 5600 Alcoholic beverages
- 5800 High fat and/or high sugar foods (e.g. foods high in sugar and/or fat that could not be assigned into one of the four major food groups, such as candies, chocolate, syrups, sauces, etc. as well as high fat/sugar foods that are usually eaten in small quantities i.e. not large enough to contribute to a Food Guide Serving)

## **6000 MEAL REPLACEMENTS AND SUPPLEMENTS**

- 6100 Meal replacements (e.g. instant breakfast)
- 6200 Supplements (e.g. energy bar)

## **8000 RECIPES (not classified)**

## **9999 FOODS AND BEVERAGES THAT ARE NOT CLASSIFIED**

Some foods cannot be assigned a Tier until the nutrient information is available in the CNF (e.g. missing sugar values or saturated fat values). Other foods in this subgroup were not classified in the CNF/CFG classification (i.e. infant formulas and most baby foods).