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Eating habits and nutrient intake of Aboriginal adults aged 19-50, living off-reserve in Ontario and the western provinces



Key findings:

- 75% of men and women have protein, fat, and carbohydrate intakes within the recommended range.
- Eating habits do not fully meet Canada's Food Guide to Healthy Eating (1992) recommendations for Vegetables and Fruit, and Milk Products (Aboriginal men and women), and Grain Products (Aboriginal women).
- There is a high rate of overweight (29%) and obesity (38%) among this population.
- Many adults have inadequate intakes of magnesium, calcium, vitamin A and vitamin D (see [Box 1](#)).
- There is some concern that men and women may not be meeting their needs for potassium, fiber and linoleic acid, though the interpretation of adequacy for nutrients with an Adequate Intake is limited.
- More than 65% of men and women have sodium intakes greater than the Tolerable Upper Intake Level.
- Health Canada continues to recommend using Eating Well with Canada's Food Guide and Eating Well with Canada's Food Guide - First Nations, Inuit and Métis to assist people in making healthy food choices. Healthy food choices can reduce the risk of chronic diseases and improve health overall.

Introduction

To gather reliable and timely information about Canadians' dietary intake, the Canadian Community Health Survey (CCHS) cycle 2.2 was undertaken in 2004. The CCHS 2.2 provides food and nutrient intake data for Canadians of all ages (for a brief summary of the survey, see Appendix A). The survey results include data for First Nations people living off-reserve, Inuit and Métis, and non-Aboriginal people in Canada's 10 provinces. The number of Aboriginal respondents in CCHS 2.2 precludes separate analyses for First Nations, Métis and Inuit groups.

This article presents data for Aboriginal people¹ aged 19-50 years old living off-reserve¹ in Ontario and the western provinces. In this article, the reference to Aboriginal people is inclusive of Métis, Inuit and First

Nations people. Highlights of the overweight and obesity, energy intake, and food consumption results were taken from the following article: Didier Garriguet, Obesity and the eating habits of the Aboriginal population. *Health Reports*, Vol. 19, No1, March 2008 (1). The assessment of nutrient intakes is based on separate analyses and was not taken from Garriguet's article. Due to a low number of respondents from Quebec and the Atlantic provinces, Garriguet's analysis was confined to respondents from Ontario, Manitoba, Saskatchewan, Alberta and British Columbia. Thus, for consistency in reporting, the nutrient intake analyses were based on the same respondents - Aboriginal people aged 19-50 years old living off-reserve in Ontario and the western provinces. Where comparisons of the results are made with non-Aboriginal people, the sample of non-Aboriginal people was also confined to those aged 19-50 years in Ontario and the western provinces.

¹ "Aboriginal people" used throughout the text refers to Métis, Inuit, and off-reserve First Nations people living in Ontario and the western provinces.

Prevalence of overweight and obesity

Garriguet's analysis shows that 29% of Aboriginal people living in Ontario and the western provinces are overweight (Body Mass Index (BMI) 25-29.9) and 38% are obese (BMI≥30). The prevalence of overweight and obesity combined is greater in Aboriginal men (71%) compared to Aboriginal women (64%).

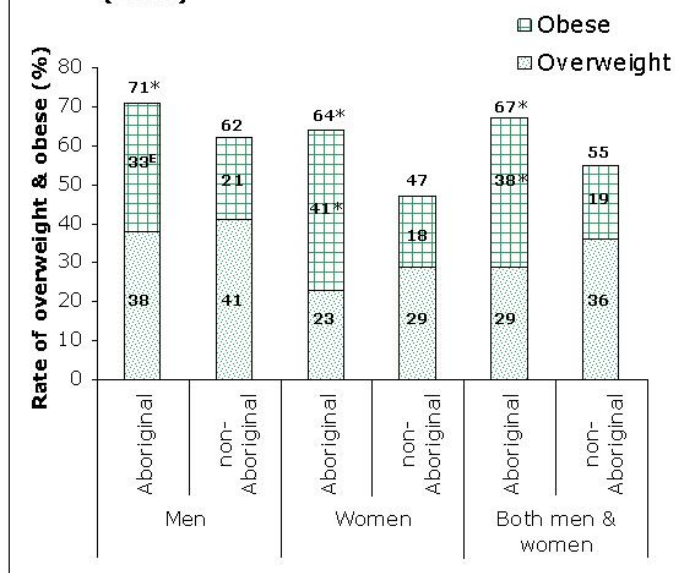
The Institute of Medicine (IOM) suggests using indicators of relative body weight, such as the Body Mass Index (BMI), as markers of energy intake adequacy within groups (populations). Thus, the proportion of individuals within a given group with a BMI below, within or above the acceptable range (BMI 18.5-24.9) can be assumed to represent respectively the proportion of people with inadequate, adequate or excessive energy intake, relative to energy expenditure (2). In the present case, since more than 67% of Aboriginal people are overweight or obese, only 33% of Aboriginal people seem to have appropriate energy balance (assuming a low prevalence of underweight in that population).

It is well known that the high prevalence of overweight and obesity is a nation-wide issue. However, prevalence varies between different sub-groups of the Canadian population. Indeed, the CCHS 2.2 results show a greater prevalence of overweight and obesity for the Aboriginal population in Canada compared to the non-Aboriginal population. Higher rates of overweight and obesity are observed among Aboriginal women (64%) compared to non-Aboriginal women (47%). Moreover, the rate of obesity alone is higher among Aboriginal women (41%) as opposed to the rate of obesity observed in non-Aboriginal women (18%). As observed in women, Aboriginal men have a greater overweight and obesity rate (71%) compared to non-Aboriginal men (62%) (Figure 1).

Energy Intake

Even though the prevalence of overweight and obesity is higher for Aboriginal people, the average daily caloric intake of Aboriginal and non-Aboriginal adults is similar (data not shown). A statistically significant difference in caloric intake was seen only for Aboriginal women 19-30 years old who consumed 359 more calories daily than non-Aboriginal women of the same age (1).

Figure 1. Percentage of overweight (BMI≥25) and obese (BMI≥30) Aboriginal adults 19-50 years old, in Ontario and the western provinces (2004)**



*Significantly different from corresponding estimate for non-Aboriginal adults in the same sample ($p < 0.05$)

** Only respondents with measured height and weight were included

BMI – Body Mass Index

E coefficient of variation 16.6% to 33.3% (interpret with caution)

Source: 2004 Canadian Community Health Survey: Nutrition

Adapted from: Garriguet D. Health Reports, 2008.

Following Canada's Food Guide to Healthy Eating (1992)

Canada's Food Guide to Healthy Eating (1992) was the food guide of reference in 2004; therefore the CCHS 2.2 results were assessed against that version of the food guide. *Canada's Food Guide to Healthy Eating* identified four food groups: Grain Products, Vegetables and Fruit, Milk Products, and Meat and Alternatives.

The analysis of eating habits by food group shows that the mean number of food servings consumed by Aboriginal men 19-50 years old falls within the recommended ranges for Grain Products, and Meat and Alternatives (Table 1). However, the average number of food servings consumed for Vegetables and Fruit, and Milk Products, was lower than recommended. On the other hand, for Aboriginal women, the mean number of food servings meets the recommended amount for the Meat and Alternatives group only, and is lower than recommended for Vegetables and Fruit, Grain Products, and Milk Products.

Table 1. Average daily servings (or grams¹) from the four food groups for 19-50 year old Aboriginal and non-Aboriginal adults in Ontario and the western provinces (2004).

	Aboriginal adults	non-Aboriginal adults	1992 Food Guide recommendations
	Mean servings/day		
Men			
Grain products	7.3	6.8	5-12
Vegetables and fruit	4.6	5.1	5-10
Milk products	1.2 *	1.6	2-4
Meat and alternatives	230 g	261g	2-3 (100-200g)
Women			
Grain products	3.9 *	4.9	5-12
Vegetables and fruit	3.6 *	4.7	5-10
Milk products	1.3	1.5	2-4
Meat and alternatives	182 g	159 g	2-3 (100-200g)

¹ Meat and alternatives are expressed in grams of cooked meat.

Sample excludes pregnant or breastfeeding women.

* Significantly different from corresponding estimate for non-Aboriginal adults in the same sample (p<0.05)

Source: 2004 Canadian Community Health Survey: Nutrition

Adapted from: Garriguet D. Health Reports, 2008.

Foods that did not belong to the four food groups in *Canada's Food Guide to Healthy Eating* (1992) were categorized as "Other Foods". Foods included in that category are often rich in energy, salt, fat and/or sugar. Examples are candy, potato chips, and regular soft drinks. Consumption of foods rich in energy, salt, fat and/or sugar contributes to an increased risk of obesity and chronic disease (3).

A look at the proportion of energy intake coming from the different foods consumed by 19-50 year olds reveals that a large percentage of their daily energy intake was from "Other Foods" - 28.7% for Aboriginal men, 32.5% for Aboriginal women. Moreover, results show that snacks between meals accounted for 63% of the calories from the "Other Foods" category for Aboriginal women 19-30 years old (1).

Consumption of soft drinks

Regular soft drinks have already been identified as a leading source of energy from the "Other Foods" category for the population overall in Canada (1). Garriguet's results revealed that, among Aboriginal people, more individuals consume regular soft drinks compared to non-Aboriginal people. For example, 56% of Aboriginal men 31-50 years consume regular soft drinks compared to 29% of non-Aboriginal men of the same age (1).

In addition, the daily average quantity of regular soft drinks consumed is significantly higher for Aboriginal people compared to non-Aboriginal people except for men 19-30 years old (Table 2). Garriguet's analysis shows that for young Aboriginal women (19-30 years), the average intake of regular soft drinks corresponds to 450 g/day, or a little more than one 355 mL can of regular soft drink per day. Women 31-50 years old showed a lower average intake. The average daily intake of regular soft drinks by Aboriginal men (19-30 and 31-50 years) is about 408 g/day, which corresponds to approximately one can and contributes 170 kcal and 38 g of sugar (more than 7 teaspoons) daily.

Regular soft drinks can add a significant amount to daily energy intake, but do not otherwise contribute to the nutrient intake of the diet. Further, regular soft drinks may displace the intake of nutrient dense liquids such as milk (4), consequently impacting on the nutrient adequacy of regular soft drink consumers.

Consumption of "sandwiches"

Previous analyses found that the "sandwich" category contributed more fat to the Canadian diet than did any other single category (5). The sandwich category includes sandwiches, pizza, submarines, hamburgers and hot-dogs. These foods were found to be popular choices among Aboriginal people aged 19-50 years (1).

Table 2. Daily consumption of regular soft drinks by Aboriginal adults, off-reserve, and non- Aboriginal adults, in Ontario and the western provinces (2004).

Average consumption	Aboriginal adults off-reserve	non-Aboriginal adults
	Regular soft drinks (g/d)	
19-30 years old		
Men	408 ^E	297
Women	450 ^E *	139
31-50 years old		
Men	407 ^{E*}	176
Women	243 ^E *	88

* Significantly different from corresponding estimate for non-Aboriginal adults (p<0.05)

^E Coefficient of variation 16.6 to 33.3% (interpret with caution)
Sample excludes pregnant or breastfeeding women.

Source: 2004 Canadian Community Health Survey: Nutrition.

Adapted from: Garriguet D. Health Reports, 2008.

Results show that 17 to 20% of the total energy intake of the 19-30 year old Aboriginal men and women as well as the 31-50 year old men was consumed in the form of sandwiches. For older women, 31-50 years, about 9% of the total energy intake came from the sandwich category (1).

Aboriginal women aged 19-30 years consumed 6% more calories over the day in the form of sandwiches, compared to non-Aboriginal women of the same age. For the other age-sex groups, the percentage of total energy intake coming from sandwiches was not significantly different between Aboriginal and non-Aboriginal people (Table 3).

Table 3. Percentage of calories coming from sandwiches¹ for Aboriginal adults, off-reserve, and non-Aboriginal adults, in Ontario and the western provinces (2004).

	Aboriginal adults off-reserve	non-Aboriginal adults
	Sandwiches (% calories)	
19-30 years old		
Men	20.0 ^E	15.5
Women	18.5*	12.5
31-50 years old		
Men	16.8	14.8
Women	8.5 ^E	10.3

¹ 'Sandwiches' includes not only sandwiches per se, but also pizza, submarines, hamburgers and hot dogs.

^E Coefficient of variation 16.6 to 33.3% (interpret with caution)
Sample excludes pregnant or breastfeeding women

* Significantly different from corresponding estimate for non-Aboriginal adults (p<0.05)

Source: 2004 Canadian Community Health Survey: Nutrition.

Adapted from: Garriguet D. Health Reports, 2008.

Of note, the sandwich category also contributes to the high sodium intake in the diet of Canadians. A study conducted in 2008 showed that 11% of the total daily sodium intake in the diet of Canadian adults came from the sandwich group (6). The sandwich group in this study did not include hamburgers and hot-dogs; only sandwiches such as ham and cheese were included.

Increased sodium intake is a concern primarily because of its role in elevated blood pressure, which is directly related to heart and renal disease (2). In addition to excess sodium, other risk factors for high blood pressure include: being overweight or obese, lack of physical activity, excessive alcohol intake, age, and family history of hypertension.

Assessment of usual intakes

Small sample size

Tables presenting the usual nutrient intake of Canadians using CCHS 2.2 data were produced and disseminated (8). Data on population-level usual nutrient intakes can be used to assess the prevalence of excessive or inadequate intakes of certain nutrients by comparing nutrient intakes to reference values found in the Dietary Reference Intakes (DRIs) (definitions and uses of the DRIs are found in Appendices B & C).

Unfortunately, the assessment of the usual nutrient intakes of Aboriginal people was limited because of a high degree of variability in the results for some DRI age and sex groups resulting from small sample sizes. Combining the DRI age groups, 19-30 and 31-50 years, into one age group of 19-50 years helped to reduce the variability in the results. Thus, these age groups were combined for the analysis of those nutrients which have the same DRI value for these two age groups. Furthermore, due to the high variability in the data, the prevalence of inadequate intake could only be estimated for some nutrients with an Estimated Average Requirement (EAR) (see Table 6 for the results). Tables showing the nutrient intake distributions for Aboriginal men and women, 19-50 years, are found in Appendix D.

Macronutrient intake

The macronutrient intakes of most Aboriginal men and women 19-50 years old fall within the recommended ranges (Acceptable Macronutrient Distribution Range (AMDR)), particularly for **protein** and **total fat** (Table 4). The **saturated fat** intake varies between 10-12% of total energy intake (data not shown).

Table 4. Proportion of Aboriginal adults, off-reserve, 19-50 years, in Ontario and the western provinces with macronutrient intakes within the Acceptable Macronutrient Distribution Ranges (AMDR) (2004).

	Carbohydrate	Protein	Fat
	% respondents within the AMDR		
19-50 years old			
Men	75.5	93.5	90.2
Women	82.4	99.6	88.2

AMDR (% energy) for men and women	45-65%	10-35%	20-35%
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Note: The percent of men and women below the AMDR and the percent of men above the AMDR for carbohydrate cannot be reported because of extreme sampling variability; the percent of women above the AMDR for carbohydrate is <3.

Source: 2004 Canadian Community Health Survey: Nutrition.

Vitamins and minerals with an Adequate Intake

While median **potassium**, **fiber** and **linoleic acid** intakes are lower than the Adequate Intake (AI), no assessment of adequacy or inadequacy can be made (see Appendix C). Intake levels for **alpha-linolenic acid** are above the AI. This indicates a low prevalence of inadequate intake for that nutrient (Table 5).

98.2% of men and 68.5% of women show **sodium** intakes above the Tolerable Upper Intake Level (UL). This is considered to be excessive and associated with an increased risk to health (Appendix B).

Table 5. Assessment of adequacy for nutrients with an Adequate Intake (AI) in Aboriginal adults, off-reserve, 19-50 years, in Ontario and the western provinces (2004).

	Nutrients with a median intake <AI; adequacy of intakes cannot be assessed	Nutrients with a median intake ≥ AI; low prevalence of inadequacy	Nutrients with a median intake > AI; increased risk of adverse health effects
Nutrients	potassium fibre linoleic acid	alpha-linolenic acid	sodium

UL: Tolerable Upper Intake Level

Source: 2004 Canadian Community Health Survey: Nutrition.

Vitamins and minerals with an Estimated Average Requirement

The prevalence of inadequacy of **vitamin A** and **calcium** intakes is high for Aboriginal people 19-50 years (Table 6). Table 6 also shows that the prevalence of inadequate **iron** intake is around 20% in Aboriginal women. A prevalence of inadequate intakes of less than 10% was observed for **niacin** in men and women. As for vitamin D, over 90% of men and women have inadequate intakes (see Box 1). As mentioned, the high variability in the data means the prevalence of inadequate intake could be estimated for only some nutrients with an EAR.

Table 6. Prevalence of inadequacy for nutrients with an Estimated Average Requirement (EAR) in Aboriginal women and men, off-reserve, 19-50 years, in Ontario and the western provinces (2004).

Nutrients	Prevalence of inadequacy	
	Women	Men
Niacin	<3	<3
Iron	21%	F
Vitamin A	58%	71%
Calcium	74% ^E	56%
Vitamin D (see Box 1)	93%	96%

^E Data with a coefficient of variation (CV) from 16.6% to 33.3%; interpret with caution

<3 Interpret with caution

^F Coefficient of variation (CV) is greater than 33.3%.

Note: Data regarding the prevalence of inadequate intake was suppressed for riboflavin, thiamin, vitamin B6, vitamin B12, vitamin C, dietary folate, phosphorus, and zinc, because of extreme sampling variability; coefficient of variation (CV) is greater than 33.3%.

Box 1. Vitamin D Intake Assessment

Estimates of the prevalence of inadequate intakes of vitamin D from food must be interpreted with caution. Vitamin D is unique as it can also be synthesized by the body from sunlight (UV radiation). In addition, vitamin D intakes from supplements have not been considered in this assessment.

What do these results mean for promoting healthy eating among Aboriginal people?

Overall, results show a high prevalence of overweight and obesity for the Aboriginal population, and eating habits that do not meet *Canada's Food Guide to Healthy Eating* (1992) recommendations. One important finding to note is that a high proportion of foods are consumed from the "Other Foods" category, and these foods are generally high in energy, fat, salt and/or sugar.

Moreover, the high consumption of regular soft drinks contributes extra sugar and, consequently, extra calories to the diet. Finally, high consumption of foods high in salt, such as those in the sandwich category, contributes to the high quantity of sodium in the diet of Aboriginal people. It is known that a diet rich in sodium, sugar and saturated fat is associated with a high risk of developing chronic diseases such as hypertension, heart disease and diabetes (3).

The promotion of specific recommendations from *Eating Well with Canada's Food Guide - First Nations, Inuit and Métis*, like those highlighted below, can help individuals meet their requirement for certain nutrients:

- “Meet your recommended number of food guide serving of vegetables and fruit each day” (vitamins A and C, and folate).
- “Eat at least one dark green and one orange vegetable each day” (vitamins A and B6, and folate).
- “Drink 2 cups of milk (1%, 2%) each day” (vitamin A, calcium, vitamin D and zinc).

In addition, health professionals and policy makers have a role in helping to increase access to, and availability of, healthy food choices in Aboriginal communities. Furthermore, they can work with the food industry and other partners to improve the food supply by reducing sugar, salt (sodium) and trans fat in foods.

Tools for practice

The recommendations found in *Eating Well with Canada's Food Guide - First Nations, Inuit and Métis* aim to help people meet their nutrient needs while reducing the risk of chronic diseases. This food guide was developed to reflect the values, traditions and food choices of Aboriginal people. This food guide can be an important tool for individuals, families and communities to learn about eating well with traditional foods and/or store-bought foods. The food guide can be a basic component of nutrition education activities, or provide the basis for nutrition policies, programs and guidelines across the country. It can be used in settings such as schools, daycare centres and workplaces to plan menus. You can download or order *Eating Well with Canada's Food Guide for First Nations, Inuit and Métis* (<http://www.hc-sc.gc.ca/fn-an/pubs/fnim-pnim/index-eng.php>) and a Ready-to-Use Powerpoint Presentation for Educators (<http://www.hc-sc.gc.ca/fn-an/food-guide-aliment/fnim-pnim/index-eng.php>).

Other useful tools include the Nutrition Facts table, and the ingredient list on prepackaged foods, both of which

can be used to make more informed and healthy choices about foods being purchased. To promote the use and understanding of the Nutrition Label, tools such as The Nutrition Labelling Toolkit for Educators – First Nations and Inuit version, which includes a downloadable ready-to-use presentation, and the Interactive Nutrition Label can be used in nutrition education activities(<http://www.hc-sc.gc.ca/fn-an/label-etiquet/nutrition/fni-pni/nutri-kit-trousse/index-eng.php>).

Community based programs

Several programs promote healthy eating for Aboriginal people of different ages, including age groups beyond those discussed in this article, through community-based activities.

- The Canada Prenatal Nutrition Program (CPNP) (http://www.hc-sc.gc.ca/fniah-spnia/pubs/aborig-autoch/2007_compendium/1_comm_prog-eng.php) or (http://www.phac-aspc.gc.ca/dca-dea/programs-mes/cpnp_main-eng.php)
- The Aboriginal Head Start Program (AHS) (http://www.phac-aspc.gc.ca/dca-dea/programs-mes/ahs_main-eng.php) or (http://www.hc-sc.gc.ca/fniah-spnia/famil/develop/ahs-or-papa_intro-eng.php)
- The Community Action Program for Children (CAPC) (http://www.phac-aspc.gc.ca/dca-dea/programs-mes/capc_main-eng.php) supports healthy lifestyles with emphasis on healthy eating and physical activity.
- The Aboriginal Diabetes Initiative (ADI) (<http://www.hc-sc.gc.ca/fniah-spnia/diseases-maladies/diabete/index-eng.php#a7>) delivers a range of primary prevention, screening and treatment programs and services, largely for on-reserve First Nations and Inuit communities.

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8. Health Canada, Statistics Canada, Canadian Community Health Survey Cycle 2.2, Nutrition (2004), Provincial, Regional and National Summary Data Tables. 2008. http://www.hc-sc.gc.ca/fn-an/surveill/nutrition/commun/cchs_focus-volet_escs-eng.php#p1

Appendix A

Data Source and Dietary Recalls

- The data were obtained from the CCHS 2.2 (http://www.hc-sc.gc.ca/fn-an/surveill/nutrition/commun/cchs_focus-volet_escc-eng.php) (total respondents, n = 35,107; Aboriginal respondents aged 19-50 years, n = 443) which was designed to provide reliable information about food and nutrient intakes, nutritional well-being and their key determinants at the national and provincial levels.
 - The CCHS excludes members of the regular Canadian Forces and people living in the territories, on Indian reserves, in institutions, in some remote regions and all residents of Canadian Forces bases.
 - Analysis was performed using Statistics Canada's CCHS 2.2 Share File. Estimates of usual nutrient intakes were based on 24-hour dietary recalls. The nutrient content of foods and beverages reported by respondents was obtained from the Canadian Nutrient File, version 2001b¹.
 - Day to day variation in an individual's nutrient intake was assessed and usual intake was estimated using the Software for Intake Distribution Estimation (SIDE). The bootstrap method, which takes into account the complex survey design, was used to estimate standard errors ^{2,3}.
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1. Health Canada. The Canadian Nutrient File. Nutrition Research Division, editor. [9]. 2001.
Ref Type: Data File
2. Rao JNK, Wu CFJ, Yu K. Some recent work on resampling methods for complex surveys. *Survey Methodology* 1992;18(2):209-17.
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Appendix B

Definitions¹

Dietary Reference Intakes (DRIs)

A set of nutrient reference values used in Canada and the United States to plan or assess nutrient intakes of individuals or groups.

Estimated Average Requirement (EAR)

The average daily nutrient intake level that is estimated to meet the requirement of half the healthy individuals in a life-stage and gender group. The EAR is used to calculate the Recommended Dietary Allowance – the average daily nutrient intake level that is sufficient to meet the nutrient requirement of nearly all (97 to 98 percent) healthy individuals in a life-stage and gender group.

Adequate Intake (AI)

The recommended average daily nutrient intake level based on observed or experimentally determined approximations or estimates of nutrient intake by a group of apparently healthy people who are assumed to be maintaining adequate nutritional status. An AI is fixed when there is insufficient evidence to establish the distribution of requirements and subsequently, to determine an EAR.

Tolerable Upper Intake Level (UL)

The highest average daily nutrient intake level likely to pose no risk of adverse health effects to almost all individuals in a life-stage and gender group. As intake increases above the UL so does the potential risk of adverse effects.

Acceptable Macronutrient Distribution Range (AMDR)

The range of intake of an energy source (i.e. fat, protein, carbohydrate) that is associated with a reduced risk of chronic disease while providing adequate amount of essential nutrients.

1. Institute of Medicine. Dietary Reference Intakes: The Essential Guide to Nutrient Requirements. Washington: The National Academies Press; 2006.

Appendix C

Using the Dietary Reference Intakes to Assess a Group's Nutrient Intakes

According to the Institute of Medicine, which oversees the establishment of the DRIs, usual nutrient intakes estimated from 24-hour recalls should be assessed against the appropriate DRIs in the following way¹:

1) for nutrients with an Estimated Average Requirement (EAR) the proportion of the group with a usual intake below the EAR indicates the prevalence of inadequate intake of that nutrient within the group. Similarly, the proportion with a usual intake above the EAR represents the percent of the group that meet or exceed their requirements. This approach, called the EAR cut-point method, applies to all nutrients with an EAR except iron in menstruating women (in which case the probability approach must be used because of an asymmetrical requirement distribution).

2) for nutrients with an Adequate Intake (AI) when the group's median usual intake is at or above the AI there is a low prevalence of inadequate intake of that nutrient. However, when the group's median usual intake is below the AI one cannot assume that this corresponds to inadequacy. An AI is fixed when there is insufficient evidence to establish the distribution of requirements and subsequently determine an EAR for a nutrient. It is thus not possible to determine the proportion of the group below their requirements based on the AI. Overall, the AI has limited use in assessing usual nutrient intakes of groups.

3) for nutrients with a Tolerable Upper Intake Level (UL) the proportion of the group with a usual intake above the UL corresponds to the percent of the group at potential risk of adverse health effects due to excessive intake of a given nutrient.

4) for nutrients with an Acceptable Macronutrient Distribution Range (AMDR) the proportion of the group within the AMDR corresponds to the percent of the group with macronutrient intakes within the range of intake associated with reduced risk of chronic diseases while providing adequate amounts of essential nutrients.

1. The Subcommittee on the Interpretation and Uses of Dietary Reference Intakes, The Standing Committee on the Scientific Evaluation of Dietary Reference Intakes. Dietary Reference Intakes: Applications in Dietary Assessment. Washington: The National Academies Press; 2000.

Appendix D

Appendix D: Summary Nutrient Intake Tables

Nutrients with an EAR: Usual intakes from food, Aboriginal adults, off-reserve, 19-50 years old, in Ontario and the western provinces (2004)¹

Nutrient	Sex	nMean (SE)			Percentiles (and SE ⁴) of usual intake										
					5th (SE)	10th (SE)	25th (SE)	50th (SE)	75th (SE)	90th (SE)	95th (SE)	EAR ²	%<EAR (SE)	UL ³	%>UL (SE)
Vit. A	Male	179	529 (55)		268 (78) ^E	310 (75) ^E	395 (69) ^E	512 (69)	655 (86)	809 (125)	914 (162) ^E	625	70.6 (13.1) ^E		
	Female	264	495 (51)		196 (62) ^E	237 (60) ^E	316 (58) ^E	449 (56)	621 (80)	808 (125)	942 (163) ^E	500	58.3 (12.8) ^E		
Vit. B6	Male	179	2.0 (0.1)		0.9 (0.2) ^E	1.1 (0.2)	1.5 (0.1)	2.0 (0.1)	2.5 (0.2)	3.1 (0.3)	3.4 (0.3)	1.1	F	100	0.0 (0.0)
	Female	264	1.5 (0.1)		0.9 (0.1)	1.0 (0.1)	1.2 (0.1)	1.4 (0.1)	1.7 (0.1)	2.0 (0.2)	2.2 (0.2)	1.1	F	100	0.0 (0.0)
Vit. B12	Male	179	4.4 (0.5)		2.3 (0.7) ^E	2.6 (0.6) ^E	3.4 (0.6) ^E	4.2 (0.6)	5.0 (0.7)	6.0 (1.1) ^E	6.7 (1.3) ^E	1.1	<3		
	Female	264	3.3 (0.4)		1.5 (0.3) ^E	1.7 (0.3) ^E	2.2 (0.3)	2.9 (0.4)	3.9 (0.5)	5.1 (0.8)	5.9 (1.0) ^E	1.1	F		
Vit. C*	Male	179	149 (28) ^E		F	F	94 (29) ^E	143 (32) ^E	203 (45) ^E	280 (70) ^E	334 (92) ^E		F	2000	<3 179
	Female	264	112 (12)		F	40 (13) ^E	61 (13) ^E	94 (14)	138 (20)	190 (31)	226 (40) ^E		F	2000	0.0 (0.0)
Thiamin	Male	179	2.1 (0.2)		1.1 (0.2) ^E	1.3 (0.2)	1.6 (0.2)	1.9 (0.2)	2.4 (0.3)	2.9 (0.4)	3.3 (0.5)	1.0	F		
	Female	264	1.4 (0.1)		0.8 (0.2) ^E	0.9 (0.1)	1.1 (0.1)	1.3 (0.1)	1.5 (0.1)	1.8 (0.2)	1.9 (0.2)	0.9	F		
Niacin	Male	179	46 (4)		22 (4) ^E	26 (3)	33 (3)	42 (4)	55 (5)	70 (9)	82 (12)	12	<3		
	Female	264	33 (2)		21 (3)	23 (3)	28 (2)	33 (2)	39 (3)	45 (4)	49 (5)	11	<3		
Ribofla-vin	Male	179	2.1 (0.1)		1.0 (0.2) ^E	1.3 (0.2)	1.6 (0.1)	2.0 (0.2)	2.4 (0.2)	3.0 (0.3)	3.3 (0.3)	1.1	F		
	Female	264	1.6 (0.1)		0.9 (0.2) ^E	1.0 (0.2)	1.3 (0.1)	1.5 (0.1)	1.9 (0.2)	2.2 (0.3)	2.5 (0.3)	0.9	F		
Folate	Male	179	546 (47)		307 (60) ^E	345 (55)	420 (47)	521 (42)	636 (54)	757 (82)	847 (110)	320	F		
	Female	264	374 (24)		232 (42) ^E	259 (38)	307 (33)	366 (31)	433 (38)	500 (52)	543 (62)	320	F		
Vit. D†	Male	179	5.3 (0.6)		F	2.8 (0.8) ^E	3.8 (0.7) ^E	5.1 (0.7)	6.7 (0.9)	8.4 (1.3)	9.5 (1.7) ^E	10	96.3 (3.7)	100	0.0 (0.0)
	Female	264	4.8 (0.8)		F	1.7 (0.5) ^E	2.5 (0.5) ^E	3.8 (0.7) ^E	5.8 (1.1) ^E	8.7 (1.9) ^E	11.0 (2.7) ^E	10	93.3 (4.4)	100	0.0 (0.0)

Nutrient	Sex	n		Mean (SE)		Percentiles (and SE ⁴) of usual intake						EAR ²	% <EAR	(SE)	UL ³	% >UL	(SE)							
						5th (SE)	10th (SE)	25th (SE)	50th (SE)	75th (SE)	90th (SE)	95th (SE)												
Phosphorus	Male	179	1504	(95)	702	(120) ^E	859	(105)	1129	(93)	1444	(108)	1800	(136)	2184	(181)	2454	(225)	580	F		4000	<3	
	Female	264	1154	(88)	566	(93)	654	(92)	835	(86)	1078	(89)	1364	(119)	1676	(172)	1892	(215)	580	F		4000	0.0	(0.0)
Zinc	Male	179	14	(2)	7	(2) ^E	8	(2) ^E	10	(1)	13	(2)	17	(2)	21	(4) ^E	24	(5) ^E	9.4	F		40	<3	
	Female	264	9	(1)	6	(1)	6	(1)	8	(1)	9	(1)	11	(1)	13	(1)	14	(2)	6.8	F		40	0.0	(0.0)
Iron	Male	179	16.6	(1.5)	8.6	(1.5) ^E	10.0	(1.5)	12.5	(1.4)	15.7	(1.4)	19.7	(1.9)	24.5	(2.8)	27.8	(3.6)	6.0	F		45	<3	
	Female	264	11.5	(0.7)	7.0	(1.0)	7.8	(1.0)	9.3	(0.9)	11.4	(0.9)	13.7	(1.1)	16.0	(1.4)	17.4	(1.7)	7.7	21.0	(5.0) ^E	45	0.0	(0.0)
Calcium	Male	179	796	(55)	379	(65) ^E	455	(60)	590	(54)	758	(59)	957	(81)	1183	(117)	1346	(150)	800	56.2	(9.2)	2500	<3	
	Female	264	746	(100)	338	(87) ^E	392	(83) ^E	494	(80)	630	(85)	814	(111)	1032	(162)	1176	(203) ^E	800	73.5	(12.7) ^E	2500	<3	

Data source: Statistics Canada, Canadian Community Health Survey, Cycle 2.2, Nutrition (2004) - Share File

Symbol Legend

- ^E Data with a coefficient of variation (CV) from 16.6% to 33.3%; interpret with caution.
- <3 Data with a coefficient of variation (CV) greater than 33.3% with a 95% confidence interval entirely between 0 and 3%; interpret with caution.
- ^F Data with a coefficient of variation (CV) greater than 33.3% with a 95% confidence interval not entirely between 0 and 3%; suppressed due to extreme sampling variability.
- * Distribution of smokers and non-smokers combined, therefore no EAR value can be shown.
- † Vitamin D dietary intake data cannot stand alone and consideration must be given to serum 25OHD levels.

Footnotes

- ¹ Intakes are based on food consumption.
- ² EAR is the Estimated Average Requirement.
- ³ UL is the Tolerable Upper Intake Level.
- ⁴ Standard Error.

Nutrients with an AI: Usual intakes from food, Aboriginal adults, off-reserve, 19-50 year old, in Ontario and the western provinces (2004)¹

Nutrient	Sex	Percentiles (and SE ⁴) of usual intake																						
		n	Mean	(SE)	5th (SE)	10th (SE)	25th (SE)	50th (SE)	75th (SE)	90th (SE)	95th (SE)	AI ²	% ≥AI	(SE)	UL ³	% >UL	(SE)							
Potas-sium	Male	179	3368	(302)	1586	(314) ^E	1877	(322) ^E	2476	(346)	3316	(353)	4170	(382)	5071	(484)	5729	(595)	4700	F				
	Female	264	2531	(146)	1579	(202)	1741	(186)	2041	(168)	2418	(176)	2844	(229)	3283	(325)	3575	(403)	4700	<3				
Sodium	Male	179	3767	(298)	2556	(480) ^E	2777	(433)	3180	(366)	3680	(335)	4225	(408)	4783	(572)	5159	(699)	1500	100.0	(1.0)	2300	98.2	(5.9)
	Female	264	2804	(157)	1503	(221)	1725	(205)	2149	(181)	2716	(181)	3378	(244)	4047	(351)	4489	(438)	1500	95.1	(2.8)	2300	68.5	(8.7)

Data source: Statistics Canada, Canadian Community Health Survey, Cycle 2.2, Nutrition (2004) - Share File

Symbol Legend

^E Data with a coefficient of variation (CV) from 16.6% to 33.3%; interpret with caution.
<3 Data with a coefficient of variation (CV) greater than 33.3% with a 95% confidence interval entirely between 0 and 3%; interpret with caution.
^F Data with a coefficient of variation (CV) greater than 33.3% with a 95% confidence interval not entirely between 0 and 3%; suppressed due to extreme sampling variability.

Footnotes

¹ Intakes are based on food consumption.
² AI is the Adequate Intake.
³ UL is the Tolerable Upper Intake Level.
⁴ Standard Error.