

# NUTRIENTS OF CONCERN CONSUMED BY YOUNG CHILDREN IN CHILD CARE AND HOME SETTINGS

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This study profiled the nutrients of concern in the foods consumed by a sample of children between the ages of 3-5 years overall with comparisons between where (regulated child care (RCC) and home settings).



# Purpose

Do the standards\* and criteria\* ensure foods consumed by children in RCC control for the nutrients of concern and do they influence foods consumed by children at home?

The purpose of this study was to profile the overall, RCC and home food and nutrient intakes by a sample of children attending RCC in NS.

It was hoped that this would provide some insight into the effectiveness of the RCC food and nutrition standards in influencing the development of healthy eating behaviours among young children in RCC and home settings.

- Government of Nova Scotia. (2011). *The Standards for food and nutrition in regulated child care settings*. <https://www.ednet.ns.ca/earlyyears/providers/FoodandNutritionalSupport.shtml>



# Methods

Nutrition Standards in Child  
Care Project

Data Collection  
- Participants  
- Tool

Nutrient Data Analysis



The NSCCP explored the influences of the NS RCC Food and Nutrition Standards on the eating behaviours of young children while attending RCC and at home.



Meals and snacks served in NS RCC settings must follow the food and nutrition standards servings from 2 food groups, 1 vegetable/fruit, and limits juice to 2x/week.

Criteria for nutrients of concern – maximum levels for sodium, saturated/trans fats and sugar and minimum levels for fibre.

[https://www.novascotia.ca/coms/families/provider/documents/Manual-Food\\_and\\_Nutrition.pdf](https://www.novascotia.ca/coms/families/provider/documents/Manual-Food_and_Nutrition.pdf)

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## **Manual for Food and Nutrition in Regulated Child Care Settings**



Government of Nova Scotia

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# Standards for Food and Nutrition in Regulated Child Care Settings

## 1.0 Food and Beverages Served

**Rationale** *The selection of food and beverages served in regulated child care settings is based on Eating Well with Canada's Food Guide and complies with the Food and Beverage Criteria for Regulated Child Care Settings. Eating Well with Canada's Food Guide outlines recommendations for a pattern of eating that supports healthy growth and development for children who are two years of age and older.*

*For children between the ages of six months to two years old, new foods, tastes and textures should be introduced with the goal of having all children consume foods presented in Eating Well with Canada's Food Guide by the time they are two years old.*

- 1.1 Foods and beverages served are consistent with the Food and Beverage Criteria for Regulated Child Care Settings. The facility director, or the person responsible for menu development, signs and dates the menu to confirm that it complies with the Food and Beverage Criteria.
- 1.2 Full fat milk (3.25% MF) is provided to children under the age of two years.
- 1.3 Menu planning is the responsibility of the facility director or care provider. The facility director may delegate this responsibility to one person, for example, a cook.
- 1.4 Menus are posted in a conspicuous area and identify substitutions that are made.
- 1.5 Menus are developed at least one week in advance of when they will be posted.
- 1.6 All menus and any substitutions made must be kept on file for one year.

### Indicators for Licensing

- Menus are posted and signed to confirm that the Food and Beverage Criteria have been followed in the menu development process.
- Substitutions are recorded with a date and kept on file.

Criteria



# Menu for Week of \_\_\_\_\_ to \_\_\_\_\_

	Monday	Tuesday	Wednesday	Thursday	Friday
<b>Morning Snack</b>					
<b>Snack description</b> <i>(At least 2 food groups, one of which is vegetable or fruit)</i>					
<b>Lunch</b>					
<b>Lunch description</b> <i>(All 4 food groups are included)</i>					
<b>Vegetables &amp; fruit</b>					
<b>Grain products</b>					
<b>Milk &amp; alternatives</b>					
<b>Meat &amp; alternatives</b>					
<b>Others*</b>					
<b>Afternoon Snack</b>					
<b>Snack Description</b>					
<i>(At least 2 food groups, one of which is vegetable or fruit)</i>					

\*Others include condiments, sauces, spreads and toppings



Packaged foods can be high in sodium, fat and/or sugar. Some packaged foods can be served if they fit within the criteria below.

Nutrient Criteria: Vegetables and Fruit (per Food Guide Serving)					
Food	Serving size	Sodium	Fat	Sugar	Examples
Prepared vegetables, frozen	½ cup 110 g or 125 mL	≤ 360 mg	≤ 3 g total fat  2 g or less of saturated and trans fat combined	no added sugar	Frozen vegetables such as french fries, vegetables with sauce
100% vegetable and fruit juices/blends  100% frozen unsweetened juice bars	½ cup	≤ 240 mg	N/A	no added sugar	Vegetable juices such as carrot, tomato, vegetable blends  Fruit juices such as orange, pineapple, apple, etc  Frozen bars made with 100% real juice

Note: ≤ this symbol means less than or equal to.

Packaged foods can be high in sodium, fat and/or sugar. Some packaged foods can be served if they fit within the criteria below.

Nutrient Criteria: Grain Products (per Food Guide Serving)						
Food	Serving size	Sodium	Fat	Sugar	Fibre	Examples
Bread products	1 slice bread (35 g)  ½ bagel (45 g)  ½ pita or tortilla (45 g)	≤ 240 mg	≤ 2 g saturated & trans fats combined	≤ 8 g	≥ 1.6 g	Breads, buns, rolls, bagels, tortillas, chapatti, roti, naan, bannock, pita, buns, english muffins, tortillas
Ready-to-eat cold and hot cereals	cold cereal ¾ cup – 1 cup (175-250 mL) (30g)  prepared hot cereal ¾ cup (175 mL)	≤ 350 mg	≤ 2 g saturated & trans fats combined	≤ 11 g	≥ 2 g	Wheat squares, oat O's, oatmeal
Crackers	30 g	≤ 360 mg	≤ 2 g saturated & trans fats combined	≤ 2 g	≥ 1.6 g	Whole wheat or whole grain crackers
Rice crackers, rice cakes	30 g	≤ 280 mg	≤ 2 g saturated & trans fats combined	N/A	N/A	Plain rice cakes, plain rice crackers
Pasta (fresh or dried) (no condiments or filling)	85 g dry serving*	≤ 140 mg	≤ 2 g saturated & trans fats combined	N/A	≥ 3 g	Whole wheat pasta including macaroni, spaghetti, lasagna, penne, pasta side dish
Baked goods (fresh or frozen, no sweetened fillings)	35 g	≤ 250 mg	≤ 2 g saturated & trans fats combined	≤ 50% carbohydrate from sugar	≥ 2 g	Fruit or vegetable based muffins, scones or loaves, granola bars
Pancakes and Waffles	35 g	≤ 115 mg	≤ 2 g saturated & trans fats combined	≤ 5 g	≥ 1 g	Frozen pancakes or waffles



Packaged foods can be high in sodium, fat and/or sugar. Some packaged foods can be served if they fit within the criteria below.

Nutrient Criteria: Milk and Alternatives (per Food Guide Serving)				
Food	Serving Size	Sodium	Sugar	Examples
Yogurt or kefir	¾ cup / 175 g	≤ 140 mg	≤ 30 g	Plain or fruit flavored yogurt
Yogurt beverage	200 mL	≤ 140 mg	≤ 30 g	Flavored yogurt beverage
Cheese*	1 ½ oz (50 g)	≤ 480 mg	N/A	Cheddar, mozzarella, Swiss, brick
Ricotta cheese	55 g*	≤ 240 mg	No added sugar	Plain ricotta cheese
Puddings and custards	½ cup (125 mL)	≤ 450 mg	≤ 30 g	Ready-to-eat or prepared from mix
Flavoured milk or soy beverage	1 cup/250 mL	≤ 200 mg	≤ 28 g	Chocolate milk, vanilla or chocolate soy beverage

Note: ≤ this symbol means less than or equal to.

\*This is a package serving size and not a Food Guide Serving.

Packaged foods can be high in sodium, fat and/or sugar. Some packaged foods can be served if they fit within the criteria below.

Nutrient Criteria: Meats and Alternatives (per Food Guide Serving)				
Food	Serving Size	Sodium	Fat	Examples
Poultry (frozen, plain, seasoned, coated)	2 ½ oz (75 g or 125 mL)	≤ 216 mg	≤ 12.75 g total fat	Fresh, frozen, plain, unseasoned poultry, with or without skin
Fish, seafood or shellfish (frozen, plain, seasoned, coated)	2 ½ oz (75 g or 125 mL)	≤ 216 mg	≤ 3.5 g saturated and trans fat combined	Fresh or frozen haddock, salmon, herring, halibut, trout, shrimp, mackerel, canned light tuna
Beef, pork, lamb (frozen, seasoned, etc)	2 ½ oz (75 g or 125 mL)	≤ 216 mg	≤ 12.75 g total fat ≤ 4.5 g saturated fat	Fresh or frozen meat
Processed meats	2 ½ oz (75 g or 125 mL)	≤ 490 mg	≤ 7.5 g total fat saturated and trans fat 5% or less of total fat	Luncheon meats, sliced turkey, chicken, ham, roast beef, canned meat
Liquid eggs	¼ cup (61 g)	≤ 115 mg	≤ 3.7 g	Liquid egg
Legumes (prepared)	¾ cup (175 mL)	≤ 500 mg	N/A	Baked beans, bean salads
Vegetarian, products (soy, tofu, etc)	2 ½ oz (75 g or 125 mL)	≤ 450 mg	≤ 7.5 g total fat ≤ 2 g saturated and trans fat combined	Veggie ground beef, veggie burgers, tofu

## Methods: Data Collection



Using the NSCCP 4-Day Food and Drink Diary, data was collected for 2-3 days at RCC and 1 day at home.

Research assistants recorded the data at RCC and clarified and/or confirmed data collected by parents at home as necessary.

44 RCC in NS were invited to participate

19 RCC agreed to participate

Food and drink consumption data was collected from 79 3-5 year olds

# Methods: Nutrient Data Analysis

- The data was analyzed with Food Processor SQL (Esha Research, version 10.9) and compiled in MSEXcel (Microsoft 365®)
- The compilation included the foods, drinks and all nutrients consumed by each child and by day, location and type of meal or snack.
- Nutrients of concern were calories, sodium, fats, sugar and fibre.
- Pivot table summaries were used to organize the data by the average daily nutrients of concern in total, by where (RCC or home) and by when (morning, afternoon or evening) the snacks were consumed.
- Descriptive statistics and independent t-tests determined differences between groups. Comparisons were made to the NSCCP reports on total daily nutrient intakes.



Row Labels	Average of Cals (kcal)	Average of FatCals (kcal)	Average of Sugar (g)	Average of Fib (g)
0	154.3247768	40.12742729	12.87238839	2.055381166
Afternoon Snack	159.918186	44.74869767	13.29646512	1.951635514
3	152.4522388	42.80216418	12.2241791	1.888358209
4	172.8424051	47.85911392	15.20455696	2.07025641
5	149.63	52.305	9.77	1.565
Morning Snack	149.1634764	35.84478448	12.48107296	2.151077586
3	140.8513889	32.82559441	12.53625	1.956923077
4	164.5467816	41.18241379	12.54057471	2.505402299
5	78.46	19.53	5.92	0.62
1	120.8343575	31.47054004	11.44540338	1.320291262
Afternoon Snack	144.47175	37.409	13.78897436	1.542288136
3	132.8528358	31.54223881	13.41390625	1.234242424
4	160.7707843	45.50137255	14.30980392	1.7682
5	118.08	27.59	12.51	6.06
Evening Snack	110.8163666	31.46163987	9.911806452	1.189726962
3	100.983388	26.32415301	9.382252747	1.144319527
4	128.9026613	40.05846774	11.00879032	1.293333333
5	0	0	0	0
Morning Snack	123.4674528	24.77386792	13.34367925	1.43625
3	128.9335484	23.94903226	14.41903226	1.486451613
4	113.2778571	23.22833333	11.66785714	1.43025
5	168	82.8	15.2	0
Grand Total	136.0665482	35.40308943	12.09707441	1.66144641



## Results and Discussion: Nutrients of Concern



On average, children consumed 1383 kcal/day, ranging from 638 to 2009 kcal/day. Half of the children consumed 1242 to 1498 kcal/day, within the recommended range (1198 to 1703 kcal/day) based on dietary reference intake (DRI) values for macronutrients



The average daily intake of sodium exceeded the tolerable upper limit (UL) for 3 year olds (UL=1500mg/day) by 19% and approached the UL for 4-5 year olds (UL=1900mg/d) [17].



The overall average daily intake from total fat was 27%E. Of this, saturated fat intake was 38% of total fat, 12.3%E. On days attending RCC, the average intake of saturated fat at the RCC was 10.7%E balanced by 10.5%E outside of the RCC; and represented no significant difference between these food environments.



The overall average daily intake of total sugar was 92 g/day, representing 27%E intake. On days attending RCC, 43% of total sugar was consumed in the RCC setting.

The main sources of saturated fat were from lower quality meat/alternates (deli meats, deep-fried or battered meats and sausages) and milk/alternates (most cheeses, dairy based desserts and whole milk).

Current recommendations for saturated fat are that intakes be as low as possible. The CFG represents a diet that maintains an average saturated fat content of 8-9%E, exceeded by children in this study but was similar to CCHS 2004 data that revealed 11.7%E and 10.8%E from saturated fat for 1-3 year olds and 4-8 year olds respectively.

The average daily intake of trans fats by the children in this study was less than 1 g/day. A limited amount of trans fats occur naturally in foods such as milk and meats, but the majority of are produced during food processing.

Health Canada called on the food industry to reduce trans fat levels to <2% in vegetable oils and margarines, and <5% in all other foods in 2007 that led to a ban that came into effect in 2018 .



**Table 1. Average Daily Nutrient Intakes of Children Enrolled in RCC for All Days, Days Not Attending, and Days Attending RCC; Grouped by Ages, Sex and Location**

		n	Energy (SD) <sup>1</sup> kcal	Sodium (SD) <sup>2</sup> mg	Saturated Fat (SD) <sup>3</sup> g	Total Sugar (SD) <sup>4</sup> g; %/kcal	Dietary Fibre (SD) <sup>5</sup> g
All Days	All	79	1383 (245)	1733 (428)	17 (5)	92 (25); 27%	15 (3)
	3 year-olds	46	1370 (231)	1726 (412)	17 (5)	94 (23); 27%	15 (4)
	4-5 year-olds	33	1412 (287)	1770 (502)	17 (6)	93 (28); 26%	15 (4)
	Female	39	1353 (249)	1774 (427)	17 (6)	86 (19)*j; 25%	15 (4)
	Male	40	1422 (256)	1710 (469)	16 (5)	99 (28)*j; 28%	15 (4)
	Urban	50	1386 (270)	1696 (500)	17 (6)	92 (20); 27%	15 (4)
	Rural	29	1381 (233)	1828 (339)	16 (5)	94 (32); 27%	14 (3)
Days not attending RCC	All	77	1404 (374)	1806 (797)	18 (9)	96 (36)	14 (5)
	3 year-olds	46	1444 (360)	1773 (724)	19 (9)	98 (39)	14 (6)
	4-5 year-olds	31	1388 (421)	1816 (947)	16 (10)	93 (30)	14 (5)
	Female	39	1413 (383)	1934 (820)	18 (10)	90 (34)	14 (5)
	Male	38	1447 (366)	1738 (765)	17 (8)	102 (37)	15 (6)
	Urban	50	1404 (388)	1825 (901)	18 (10)	96 (32)	14 (5)
	Rural	27	1406 (341)	1683 (579)	17 (7)	94 (46)	14 (6)
Days attending RCC – at RCC	All	72	630 (173)*a	807 (254)*f	7.5 (4)	40* <sup>k</sup> (14)	8 (3)
	3 year-olds	45	626 (162)	791 (262)	7 (4)	39 (13)	8 (2)
	4-5 year-olds	27	637 (194)	834 (241)	7 (3)	41 (15)	8 (4)
	Female	35	653 (180)*d	846 (266)*g	8 (4)	41* <sup>l</sup> (15)	8* <sup>p</sup> (3)
	Male	37	534 (206)*d	682 (278)*g	6 (4)	33* <sup>l</sup> (15)	6* <sup>p</sup> (3)
	Urban	43	627 (196)*b	769 (273)	8 (4)	41* <sup>m</sup> (16)	7 (3)
	Rural	29	636 (137)*c	863 (215)*i	7 (3)	37* <sup>n</sup> (10)	8 (3)
Days attending RCC – outside RCC	All	61	765 (247)*a	952 (389)*f	9 (5)	52* <sup>k</sup> (27)	8 (3)
	3 year-olds	37	746 (223)	932 (395)	9 (4)	52 (22)	8 (3)
	4-5 year-olds	24	796 (278)	994 (394)	9 (6)	52 (33)	8 (2)
	Female	30	688 (224)*e	910 (388)	8 (5)	42* <sup>o</sup> (16)	7 (2)
	Male	31	841 (246)*e	1002 (398)	9 (4)	53* <sup>o</sup> (30)	8 (3)
	Urban	42	753 (247)*b	889 (399)*h	9 (5)	51* <sup>m</sup> (21)	8 (3)
	Rural	19	799 (241)*c	1115 (334)*h,i	9 (4)	55* <sup>n</sup> (37)	7 (3)

\*  $P < 0.05$ ; significant differences designated by a, b, c, etc. To illustrate, \*a refers to the significant difference between energy intakes by All at RCC and by All outside RCC ( $P = 0.0007$ ); \*b and \*c to the comparable differences between energy intakes at RCC and outside RCC for urban and rural RCC respectively; \*d refers to the significantly higher energy intake by females to male at RCC; and \*e to the significantly higher energy intake by males to females outside RCC.

<sup>1</sup> Recommended energy range estimated to be 1198 to 1703 kcal/day [23]

<sup>2</sup> Sodium RDA/AI for 1-3 year old = 1000 mg/day; for 4-8 year old = 1200 mg/day [23]

<sup>3</sup> Saturated fat recommended to be as low as possible [23]

<sup>4</sup> DRI manual recommends added sugar be no more than 25% total calories [23]; WHO recommends added sugar be no more than 10% of total calories [33]

<sup>5</sup> Dietary Fibre RDA for 1-3 year old = 19 g/day; for 4-8 year old = 25 mg/day [23]

# Conclusions

This study provides insight into the important influences that food environments and RCC food and nutrition standards play in supporting healthy eating behaviors in young children.



The food and nutrition standards appear to have had a positive influence on the food and nutrition quality of RCC meals and snacks.

Significantly more vegetables, fruits, grains, water, fibre and less sugar consumed at RCC than at home.

Future research

There is an opportunity to explore how RCCs and families could form stronger partnerships that support the development of health eating behaviors of young children.

