

SNACKS CONSUMED BY YOUNG CHILDREN IN CHILD CARE AND HOME SETTINGS

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July 2022

This study profiled the food and nutrient contribution of snacks in the diets of a sample of children between the ages of 3-5 years overall with comparisons between where (regulated child care (RCC) and home settings) and when (morning, afternoon and evening) snacks were consumed.



Background - Snacks Consumed by Pre-school Children



In the USA, the average daily energy intakes by preschool children from snacks has more than doubled from 195 kcal in 1977-1978 to 439 kcal in 2011-2014.



In Canada, preschool children consumed an average of 2.3 snacks daily providing 33.2% of energy from a wide range of items including salty/sweet foods and sugar sweetened beverages (SSB).



Home feeding practices found to be most important in developing healthy eating behaviours in young children.
Many families now rely on child care and this has led to implementation of food and nutrition standards for RCC, including for snacks.

Purpose

Do the standards* ensure consumption of healthy snacks by children in RCC and do the standards influence snacks consumed by children at home?

The purpose of this study was to profile the overall, RCC and home food and nutrient intakes from snacks 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 behaviors among young children as it applies to snack consumption 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

Food Category Data
Analysis

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.



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.

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.

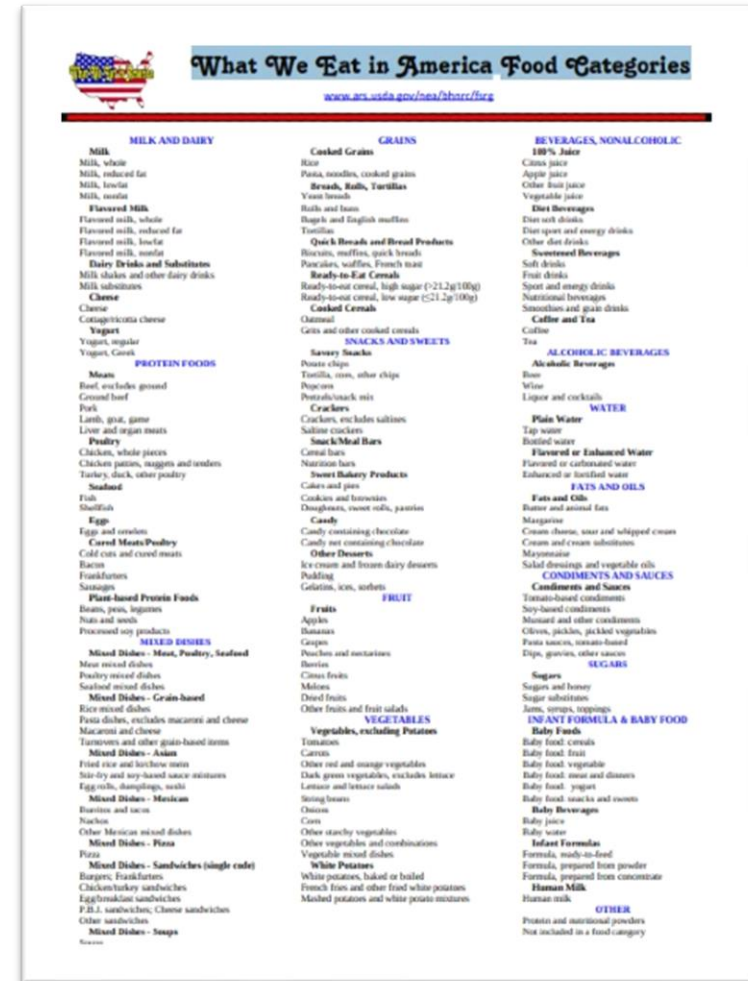


Row Labels	Average of Cals (kcal)	Average of FatCals (kcal)	Average of Sugar (g)	Average of Fib (g)
0	154.3247768	40.12742729	12.87238839	2.055381166
Afternoon Snack	159.918186	44.74869767	13.29646512	1.951635514
3	152.4522388	42.80216418	12.2241791	1.888358209
4	172.8424051	47.85911392	15.20455696	2.07025641
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



Methods: Food Categories 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.
- The snack food and drink items were coded according to a system adapted from the *What We Eat in America* (WWEIA) food categories*
- Pivot table summaries were used to organize the data by the average consumption of food categories and types 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 consumption of food categories as applicable.



MILK AND DAIRY	GRAINS	BEVERAGES, NONALCOHOLIC
Milk Milk, whole Milk, reduced fat Milk, lowfat Milk, nondairy Flavored Milk Flavored milk, whole Flavored milk, reduced fat Flavored milk, lowfat Flavored milk, nondairy Dairy Drinks and Substitutes Milk shakes and other dairy drinks Milk substitutes Cheese Cottage cheese Cheese Yogurt, regular Yogurt, Greek Protein Foods Meat Beef, excludes ground Ground beef Pork Lamb, goat, game Liver and organ meats Poultry Chicken, whole pieces Chicken parts, nuggets and tenders Turkey, duck, other poultry Seafood Fish Shellfish Eggs Eggs and egg whites Canned Meats/Poultry Cold cuts and canned meats Bacon Frankfurters Sausages Plant-based Protein Foods Beans, peas, legumes Nuts and seeds Processed soy products Mixed Dishes - Meat, Poultry, Seafood Meat mixed dishes Poultry mixed dishes Seafood mixed dishes Mixed Dishes - Grain-based Rice mixed dishes Pasta dishes, excludes macaroni and cheese Macaroni and cheese Turnovers and other grain-based items Mixed Dishes - Asian Fried rice and hot/warm soups Stir-fry and soy-based sauce mixtures Egg rolls, dumplings, sushi Mixed Dishes - Mexican Burritos and tacos Nachos Other Mexican mixed dishes Mixed Dishes - Pizza Pizza Mixed Dishes - Sandwiches (single ends) Burgers, Frankfurters Chicken/turkey sandwiches Egg/turkey sandwiches F.I.L. sandwiches, Cheese sandwiches Other sandwiches Mixed Dishes - Soups Soups	Cooked Grains Rice Pasta, noodles, cooked grains Breads, Rolls, Tortillas Yeast breads Rolls and buns Bagels and English muffins Tortillas Quick Breads and Bread Products Biscuits, muffins, quick breads Pancakes, waffles, French toast Ready-to-Eat Cereals Ready-to-eat cereal, high sugar (>21.2g/100g) Ready-to-eat cereal, low sugar (≤21.2g/100g) Cooked Cereals Oatmeal Grits and other cooked cereals Snacks and Sweets Savory Snacks Potato chips Tortilla, corn, other chips Popcorn Potato/chip mix Crackers Crackers, excludes saltines Saltine crackers Snack/Mid Bars Cereal bars Nutrition bars Sweet Bakery Products Cakes and pies Cookies and brownies Doughnuts, sweet rolls, pastries Candy Candy containing chocolate Candy not containing chocolate Other Desserts Ice cream and frozen dairy desserts Pudding Gelatin, ice, sorbets Fruits Apples Bananas Grapes Peaches and nectarines Berries Citrus fruits Mangoes Dried fruits Other fruits and fruit salads Vegetables, excluding Potatoes Tomatoes Carrots Other red and orange vegetables Dark green vegetables, excludes lettuce Lettuce and lettuce salads String beans Onions Corn Other starchy vegetables Other vegetables and combinations Vegetable mixed dishes White Potatoes White potatoes, baked or boiled French fries and other fried white potatoes Mashed potatoes and white potato mixtures	100% Juice Citrus juice Apple juice Other fruit juice Vegetable juice Diet Beverages Diet soft drinks Diet sport and energy drinks Other diet drinks Sweetened Beverages Soft drinks Fruit drinks Sport and energy drinks National beverages Smoothies and grain drinks Coffee and Tea Coffee Tea Alcoholic Beverages Beer Wine Liquor and cocktails WATER Plain Water Tap water Bottled water Flavored or Enhanced Water Flavored or carbonated water Enhanced or fortified water FATS AND OILS Fats and Oils Butter and spread fats Margarine Cream cheese, sour and whipped cream Cream and cream substitutes Mayonnaise Salad dressings and vegetable oils CONDIMENTS AND SAUCES Condiments and Sauces Tomato-based condiments Soy-based condiments Mustard and other condiments Olives, pickles, pickled vegetables Pesto sauces, tomato-based Dips, gravies, other sauces SUGARS Sugars Sugars and honey Sugar substitutes Jams, jellies, toppings INFANT FORMULA & BABY FOOD Baby Foods Baby food: cereals Baby food: fruit Baby food: vegetable Baby food: meat and dinners Baby food: yogurt Baby food: soups and meats Baby Beverages Baby juice Baby water Infant Formulas Formula, ready-to-feed Formula, prepared from powder Human Milk Human milk OTHER Protein and nutritional powders Not included in a food category

*US Department of Agriculture, Agricultural Research Service (USDA ARS). (2018). *What We Eat in America (WWEIA) Food Categories 2015-2016*. www.ars.usda.gov/nea/bhnrc/fsrg

Results and Discussion: Overall



On average, 96.2% of children consumed snacks daily and on average had 2.3 snacks per day.

- Similar to two Canadian studies and slightly lower than average for USA preschool children.



On average 82.0% of children had morning, 84.5% afternoon and 63.6% evening snacks.

- Higher than a Canadian study (children not attending RCC) for morning and afternoon and lower for evening.



On average 89.0% of children had snacks at RCC compared to 77.3% at home.

Results and Discussion: Snack Food Categories and Types



Fruit, salty/sweet items and dairy items were the WWEIA categories most consumed as snacks and more frequently at home than RCC - Similar to a number of other studies. Crackers were 45% of salty/sweet category and significantly more consumed at RCC than home – Convenience and perception they are healthy/desirable snacks

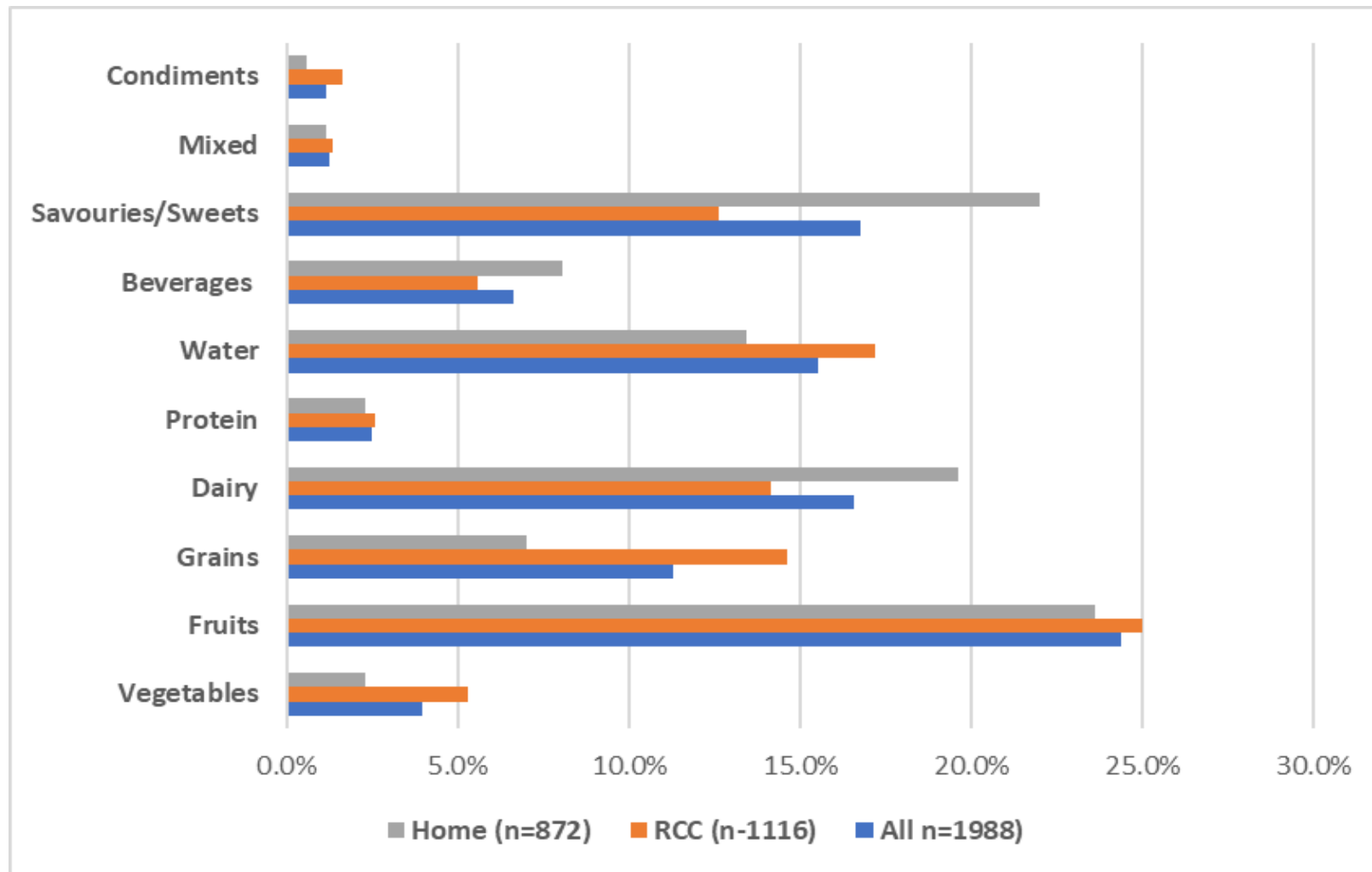


Significantly more variety of food categories, vegetables/fruits and crackers as snacks in RCC than at home and fruits predominated over vegetables. – Perhaps due to perceived preferences of children and evidence that children will select other food group over vegetables when served together.



Children consumed almost twice amount of water at RCC than at home suggesting home caregivers may not perceive this as a beverage for snacks. Less juice and SSB consumed as snacks compared to other studies.

Frequency of consumption of Snack Food Categories



Results and Discussion: Nutrients of Concern



Average daily energy contribution from snacks was 29% or 401 kcal - Comparable to Canadian studies; lower than the 439 kcal/day reported by USA national survey.

No significant differences in energy by when or where snacks consumed suggesting children self-regulate.



Average daily sodium contribution from snacks at 22.6% exceeded the 18.6% from national Canadian study – Chronic disease risk concern.

More sodium consumed as snacks at RCC than home.



Average daily sat. fat intake from snacks was 10% total fat; 3.1% of total energy. Significantly more fibre consumed from snacks at RCC than home likely influenced by standards.



Average daily sugar contribution at 40% slightly higher than Canadian studies.

Significantly more sugar intake from home morning snacks than RCC.

Results and Discussion: Overall

Table 2. Selected Nutrient Average Daily Intakes by Children from All Snacks, by Snacks in RCCs and Homes and by Sex

Nutrients	Average Daily Intakes from All Snacks	Average Daily Intakes from RCC Snacks		Average Daily Intakes from Home Snacks		
	All n=79 Girls n=39 Boys n=40	Morning n=73	Afternoon n=70	Morning n=58	Afternoon n=65	Evening n=69
Energy (% total Kcal)¹ - All	400.7±149.4 (29.0%)	167.1±76.8	172.5±84.7	177.9±95.4	182.8.4±109.4	181.5±122.4
Sodium (mg) - All	384.3±206.9	176.3±94.1	188.0±136.9	130.8±157.4	153.6±169.7	153.7±174.5
Saturated Fat (g) - All	4.5±2.7	1.8±1.7	2.0±1.9	1.7±2.7	2.0±2.5	2.5±3.1
Sugar (g) - All	36.3±12.7	13.9±6.9	14.4±8.5	19.9±12.5	17.3±11.9	15.4±10.4
Fibre (g) - All	4.7±2.4	2.4±1.3	2.1±1.4	2.0±1.6	1.8±2.1	1.8±1.5

¹ Total Energy All 1383±245; Girls 1353±249; Boys 1422±256

Conclusions

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



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



Applications

Adjustments to RCC food and nutrition regulations are suggested by the findings.

- Rather than requiring that each snack offer a vegetable/fruit with another food group, the choice for one or both RCC snacks might be another vegetable/fruit to promote consumption of this food group.

The current Canada Food Guide with three food groupings and no numbers of servings by age or serving sizes, creates an opportunity for RCC food and nutrition regulations to be more flexible in the criteria for RCC snacks

- Less emphasis on two full food group servings could lead to more creative, nutrient dense snacks



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