

What's in Your Food? A Data-Driven Nutrient Analysis

By Alina Yildir



Introduction

According to Canada's Food Guide, maintaining a balance of nutrients such as protein, fibre, carbohydrates, and potassium contributes to better overall health. At the same time, reducing the intake of saturated fat, trans fat, sugar, sodium, and cholesterol plays a key role in minimizing health risks.

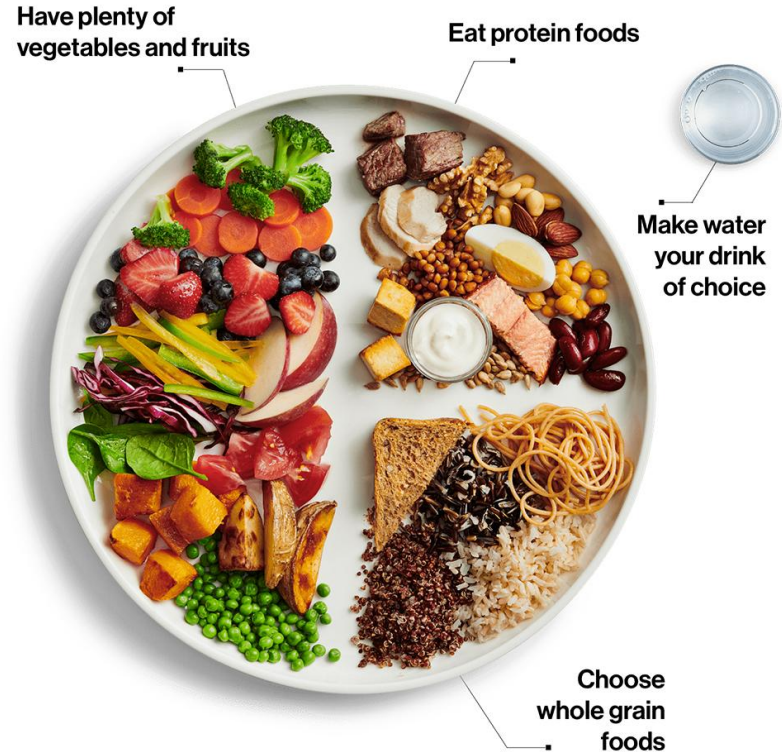


Image source: Canada's Food Guide, Government of Canada.
Retrieved from <https://food-guide.canada.ca/en/>.

Objectives

This project features two interactive tools designed to support informed dietary choices using data from The Canadian Nutrient File.

The **Tableau dashboard** allows users to explore the nutritional composition of foods by selecting a nutrient of interest, analyzing food categories, subcategories, and specific foods, and comparing nutrient levels vs. calories to identify nutrient-dense options.

The **AI-powered app** enhances this analysis with dynamic visualizations, clustering techniques, and a chatbot, helping users find optimal food sources, manage dietary restrictions, and align with personal health goals.

Nutrition Facts Valeur nutritive

Per 1 cup (250 mL)
pour 1 tasse (250 mL)

Calories 110	% Daily Value*
	% valeur quotidienne*

Fat / Lipides 0 g	0 %
Saturated / saturés 0 g	0 %
+ Trans / trans 0 g	

Carbohydrate / Glucides 26 g	
Fibre / Fibres 0 g	0 %
Sugars / Sucres 22 g	22 %

Protein / Protéines 2 g	
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Cholesterol / Cholestérol 0 mg	
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Sodium 0 mg	0 %
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Potassium 450 mg	13 %
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Calcium 30 mg	2 %
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Iron / Fer 0 mg	0 %
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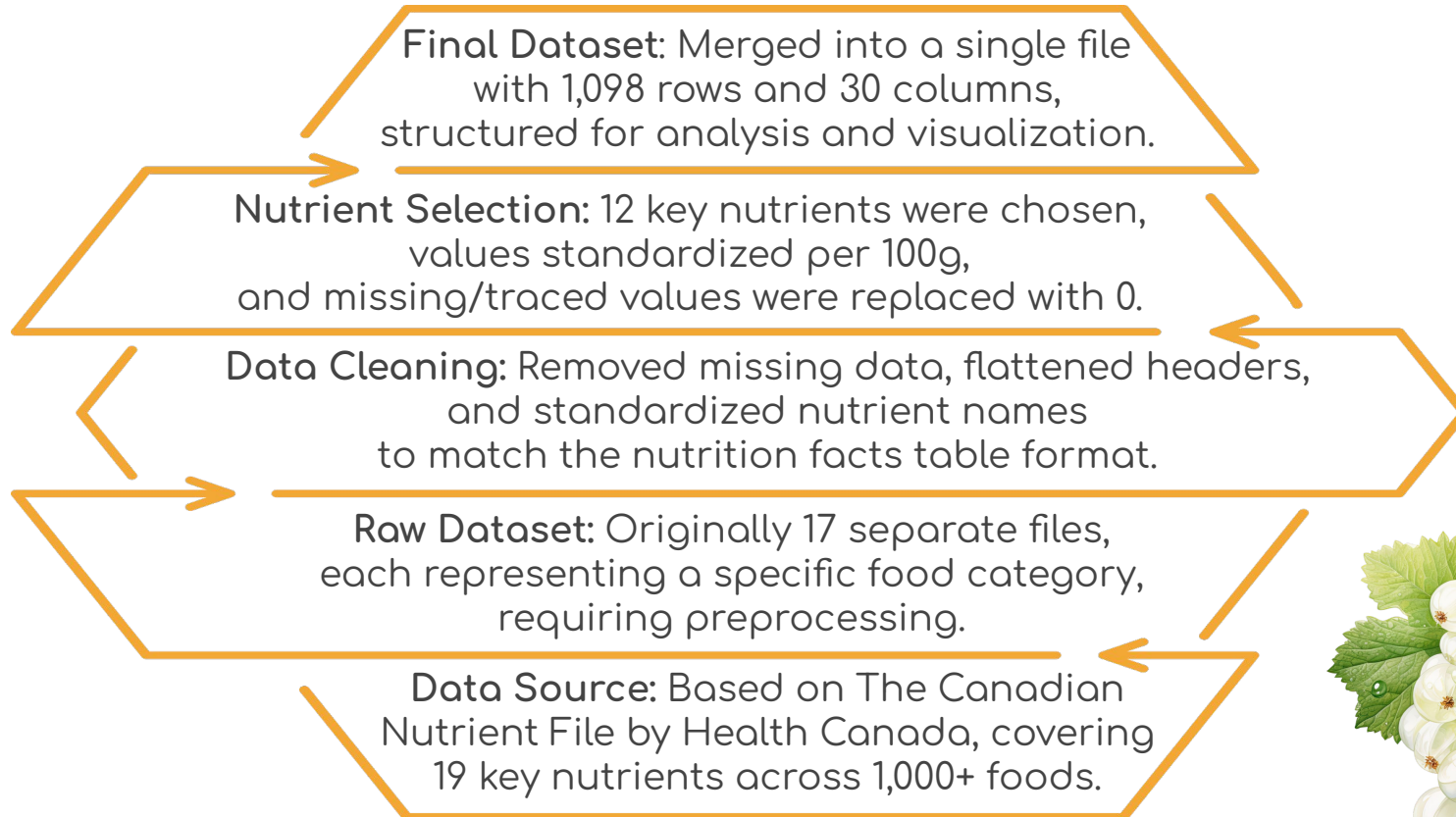
*5% or less is **a little**, 15% or more is **a lot**

*5 % ou moins c'est **peu**, 15 % ou plus c'est **beaucoup**

Image source: Nutrition Facts Tables, Government of Canada. Retrieved from

<https://www.canada.ca/en/health-canada/services/food-nutrition/nutrition-labelling/nutrition-facts-tables.html>.

Data Preprocessing



<https://public.tableau.com/app/profile/alina.yildir/viz/WhatsinYourFoodAData-DrivenNutrientAnalysis/AData-DrivenNutrientAnalysis2>



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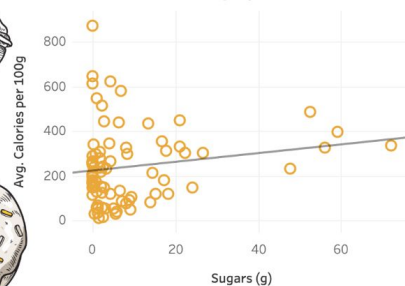
Select Nutrient Display Mode

- ☒ Per 100g
☐ Per Serving

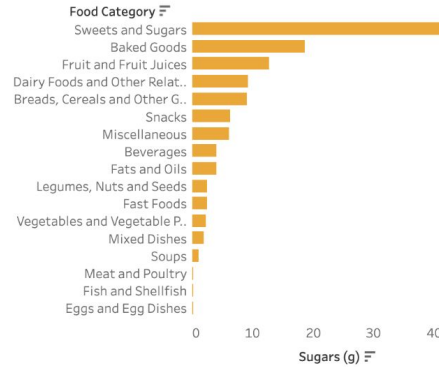
Select Nutrient to Analyze

- ☐ Calories
☐ Fat (g)
☐ Saturated (g)
☐ + Trans (g)
☐ Carbohydrate (g)
☐ Fibre (g)
☒ Sugars (g)
☐ Protein (g)
☐ Sodium (mg)
☐ Potassium (mg)
☐ Calcium (mg)
☐ Iron (mg)
☐ Cholesterol (mg)

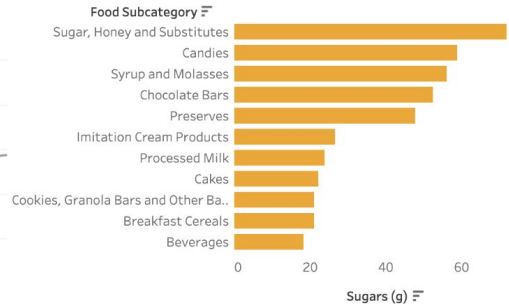
Average Sugars (g) vs. Calories per 100g by Food Subcategory



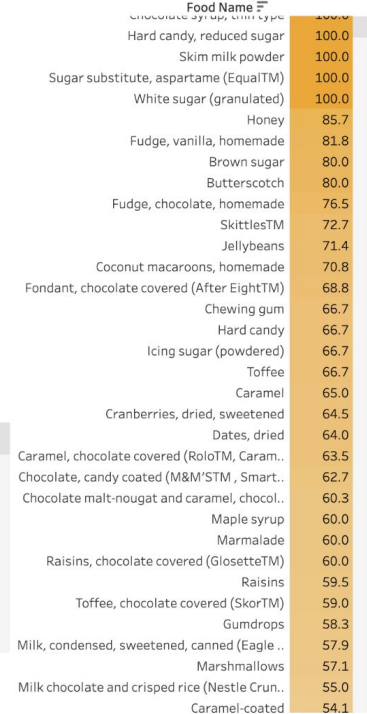
Average Sugars (g) by Food Category



Average Sugars (g) by Food Subcategory



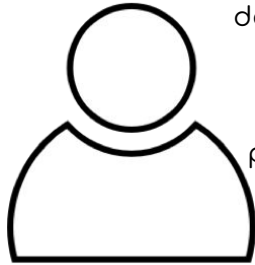
Average Sugars (g) by Food Name



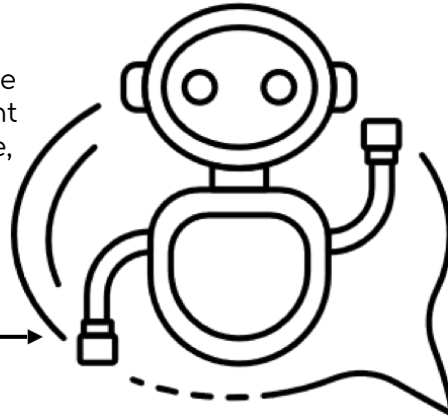


1

Which food subcategories have the highest nutrient density per calorie, particularly for macronutrients (carbohydrates, protein, and fat)?



4



2

```
df['Protein per Calorie'] = df['Protein (g)] / df['Calories']  
df['Fat per Calorie'] = df['Fat (g)] / df['Calories']  
df['Carbohydrate per Calorie'] = df['Carbohydrates (g)] /  
df['Calories']
```

```
nutrient_density = df[['Food Subcategory', 'Protein per  
Calorie', 'Fat per Calorie', 'Carbohydrate per  
Calorie']].groupby('Food  
Subcategory').mean().reset_index()
```

3



Food subcategories with the highest nutrient density per calorie, particularly for macronutrients, are:

- Carbohydrates: *Vegetables* and *Fruit* subcategories provide high carbohydrate content, primarily from dietary fibre and natural sugars, with relatively low-calorie counts, making them nutrient-dense options.
- Protein: *Fish*, *Shellfish*, and *Poultry and Game Birds* subcategories deliver high protein with fewer calories, making them excellent choices for protein-dense foods.
- Fat: *Nuts*, *Nut Butters*, and *Seeds* subcategories offer high levels of healthy fats, along with essential nutrients, while maintaining a balanced calorie-to-nutrient ratio.

Food Subcategory	Protein per Calorie	Fat per Calorie	Carbohydrate per Calorie
Baked Goods	0.0151	0.0151	0.0957
Beverages	0.0039	0.0039	0.0788
Fish	0.0254	0.0187	0.0021
Nuts	0.0148	0.0448	0.0059
Vegetables	0.0093	0.0032	0.0853

<https://yildiramdsa-nutrient-composition--csv-chatbotcsv-chatbot-kdmzcd.streamlit.app>

References

Government of Canada. (n.d.). *Canada's food guide*. Retrieved from <https://food-guide.canada.ca/en/>.

Government of Canada. (n.d.). *Nutrition facts tables*. Retrieved from <https://www.canada.ca/en/health-canada/services/food-nutrition/nutrition-labelling/nutrition-facts-tables.html>.

Government of Canada. (n.d.). *Canadian nutrient file*. Retrieved from <https://open.canada.ca/data/en/dataset/a289fd54-060c-4a96-9fcf-b1c6e706426f>.



Thank You for Your Attention!



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Master of Data Science and Analytics | Data
Wrangling & Preprocessing | Exploratory Data An...

