

# Science fair log book

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# MY QUESTION

-Primary research question

Do School children have healthy morning meals?

Secondary research question

Can I train AI to help kids classify food to healthy or unhealthy using product labels?

Training AI To identify healthy morning meals for school children

How accurate is AI with detecting healthy morning meals of children in school?



# FOODS THAT I CAN USE AND THAT CAN BE EATEN IN ONE DAY

All morning meals that I can use that kids eat across Canada eat daily.

ex . Froot loops, Honey nut cheerios and Corn pops

Need at least 50 cereals to make graphs.



# Sugar

36 grams and more daily is bad for men

25 grams for women daily is bad

4 meaning regular ex 4011

9 meaning organic ex 90234

8 rare should mean GMO( genetically modified) lemon never used ex 874512

Starches is a wheat and corn

Iron is found in lots of food to much is bad for you and not a lot is also bad

For you

Main sugar salt and fat



# Recommendations

Nutrient	Recommendation per day	Recommendation per serving	Source of recommendation
sugar	≤25 grams a day	≤6 gram per serving in cereal	
sodium	1200 to 1500 mg	Less than 150 - 200 mg	Trans fat 0 per day and serving
Total fat		25 to 35% of total calories from fat	
Saturated fat		Less than 1 to 2 grams	
fibere	Age + 5 grams	More than 3 grams	

# Cereals per serving

	Sugar	Sodium	Total fat	Sat fat	Fibere	Protein	Calories
Cheerios	1g	170 mg	2.0g.	0.5g	2g	5g	140 cal
froot loops	14g	105mg	1.5g	0.5mg	3g	2g	150
Cap'n crunch	12g	230mg	1.5g	1.0g	1g	1g	120 kcal
Lucky charms	12g	230mg	1.5g	0g	2g	3g	140 kcal
Cinnamon toast crunch	12g	230mg	4.0mg	0g	2.0g	2g	170 kcal
Apple jacks	13g	210mg	1.5g	0.5g	2.0g	2g	150 kcal
Cocoa puffs	12g	130mg	2g	0g	2g	2g	140 kcal
Frosted flakes	10g	130mg	0g	0g	0g	2g	140 kcal

# Cereals per serving

Cereals	sugar	Sodium	Total fat	fibere	protein	Sat fat	calories
shreddies	9g	210mg	1g	6g	5g	0g	200
Frosted flakes	12g	190 mg	0g	1g	1g	0g	130
Special k	0g	310mg	7g	4g	20g	1g	160
Raisin bran	17g	200mg	1g	7g	5g	0g	190
Rice krispies	4g	190-200	0g	1g	2g	0g	150
Sugar crisp	17g	70mg	0.4	1.0	2g	0g	160
Crispix	5g	260mg	0g	0g	3g	0g	150
Corn flakes	3g	190 m	0g	1g	2g	0g	110

Cereals	sugar	sodium	fibere	protein	Sat fat	Total fat	Calories
Trix	12g	180mg	1g	2g	0.0	2.0	160
Corn pop	15g	160 mg	0g	2g	0g	0g	120
Golden grahams	12.0g	290-300 mg	2.0	2.0g	0g	2.0 g	150
Multi grains	~8g	~150mg	~3g	~3g	0g	~1.5	150
Chex	4g	250mg	2g	1 to 6g	0g	1g to 4g	110
Honey smacks	18g	45mg	2g	2g	0g	0g	130
Froot loops	11g	180mg	3g	1g	0.0	0g	120
Cocoa puffs	12	130mg	2g	2g	0g	2g	140

cereals	sugar	Sodium	Total fat	fibere	protein	Sat fat	calories
Corn pops	9g	160mg	0g	4g	4.8mg	0g	120
Krave	16g	150mg	5g	2g	3g	1g	180
Honey comb	11g	110g	2.9g	1g	2g	1.3g	99
Frosted mini wheats	10g	5g	1g	6g	5g	0g	270
nesquik	12g	200mg	2g	2g	2g	0.5g	140
Life cereal	10g	230mg	2.0g	3g	5g	0.4	180
Sunny boy cereal	0g	1mg	1.9g	6g	6g	0g	130
kix	4g	220mg	1.0	3.0g	3.0g	0g	160

Cereals	sugar	sodium	Total fat	fibere	protein	Sat fat	calories
Path organic	4g	115mg	15g	2g	2g	0g	120
Oreo puffs	16g	200mg	2g	1g	2g	0g	150
vector	0g	330mg	3g	3g	6g	0.5g	215
Granola girl	8g	50mg	10g	3g	4g	4g	420
Reeses puffs	12g	220mg	4.5g	2.0g	3.0g	0.5g	160
Sugar puffs	11g	180mg	0.6	1g	2g	0.1g	120
Post cranberry almond life	12g	150mg	4g	3g	4g	0.1g	200
Prana	8g	100mg	13g	6g	6g	3g	260

Cereals	sugar	Sodium	Total fat	fibere	protein	Sat fat	calories
Weetabix	2g	190 mg	1g	6g	5g	0g	180
Red river	0g	2mg	2.5g	5g	5g	0.2g	140
Grape Nuts	5g	200mg	1.5g	5g	4g	0g	150
Magic spoon fruity	0g	160mg	8g	1g	13g	1g	150
Three wishes fruity	3g	160mg	8g	3g	13g	1g	130
Chips ahoy	11g	120mg	1.5g	1g	1g	0g	120
Chocapic cereal	9g	190 mg	3g	2g	3g	0.5g	115
Puffins	7g	210mg	1g	6g	3g	0g	140
Life	8g	170mg	2g	3g	4g	0g	160
Kashi	7g	110mg	1.5g	10g	10g	0.3g	180

# HYPOTHESIS

Hypothesis: Breakfast cereals that are marketed for children do not meet the recommendations of health organizations.

Null Hypothesis: The breakfast cereals meet the recommendations of the health organizations

Secondary: Machine learning models help predict unhealthy breakfast marketed for children



# Introduction

- Cereal consumed with milk is the most commonly eaten breakfast among Canadian school children.
- A survey showed that 37.6% of children aged 2-12 years in Canada consume cereal on any given day.
- Children often eat cereal before going to school because it is convenient, easy to prepare and serve, and inexpensive.
- Most cereals available marketed for children in Canada claim to have healthy nutrients with balanced ingredients.
- However, cereals vary greatly in their level of processing, ranging from minimally processed whole-grain options (e.g., plain oats, shredded wheat) to highly processed cereals.
  - While breakfast consumption has been associated with improved nutrient intake and diet quality in children, growing concerns have emerged regarding the nutritional profile of cereals specifically marketed to children.
  - Recent studies have revealed that breakfast cereals targeted at children often contain significantly higher levels of sugar and poorer overall nutritional quality compared to cereals marketed to the general population.
  - This raises concerns about the potential contribution to childhood obesity and long-term cardiovascular health risks.
- Given the lack of comprehensive data on the Canadian market, this study aims to evaluate the nutritional quality of breakfast cereals marketed to children in Canada and assess their suitability for daily consumption as part of a healthy dietary pattern.

# CONCLUSION

None of the cereal products marketed to children in Canada fully meet dietary recommendations. While some cereals meet one or more individual recommendations, none meet all recommended criteria. More than three quarters of products contain high levels of carbohydrates. All Cereals are unhealthy in one or more ways making none of them the “healthiest” cereal that you can buy of the market.



# ANALYSIS

Nutritional data for each breakfast cereal were summarized using descriptive statistics. Continuous variables (e.g, sugar, sodium, fibre, energy) were described using means, medians, standard deviations, and ranges. Categorical outcomes were summarized as frequencies and percentages. Each cereal was assessed against predefined nutritional thresholds based on recommendations from recognized dietary organizations for children. The primary outcome was the proportion (5) of cereals meeting all recommended criteria. Secondary outcomes included the proportion meeting individual nutrient-specific recommendations (eg, sugar, sodium, fibre).

All analyses were descriptive in nature. Results were presented using tables and simple graphical displays to illustrate compliance with dietary recommendations. Statistical analyses were conducted using STATA 17 statistical software.



# Websites

<https://www.heart.org/en/healthy-living/healthy-eating/eat-smart/sugar/how-much-sugar-is-too-much>

<https://www.health.com/complex-carbohydrates-7100033>

<https://teachablemachine.withgoogle.com/>

<https://www.wkkelloggawayfromhome.com/products/kelloggs-honey-smacks-cereal-00038000160462>

[https://www.nofrills.ca/en/corn-pops-cereal-family-size/p/20054727\\_EA](https://www.nofrills.ca/en/corn-pops-cereal-family-size/p/20054727_EA)

[https://www.nutritionvalue.org/search.php?food\\_query=Oreo+puffs+cereal](https://www.nutritionvalue.org/search.php?food_query=Oreo+puffs+cereal)

<https://www.postconsumerbrands.com/brands/oreo-puffs-cereal/products/oreo-puffs-cereal/>

<https://www.eatthismuch.com/calories/vector-cereal-110714>

<https://sweetspotnutrition.ca/healthy-cereal/>

