

# Cost and Affordability of a Healthy Diet in Canada

Thank you FPLers!! For their doctoral research that informed this talk, particular thanks: Gabriella Luongo, MPH PhD; Nathan Taylor, MSc MPH PhD(c)

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**I do not have a relationship with a for-profit and/or a not-for-profit organization to disclose**



# Learning objectives



Describe economic and social indicators through which food affordability is monitored for public policy purposes in Canada;



Contextualize the use of these indicators to address varied normative policy goals;



Explore options for public investment in high-quality digital food cost measurement with nutrition in mind.

# MENU

Entrée

**Cost and affordability of diet**

Plat principal

**The gap between nutritious and currently consumed diets**

La salade

**Role of consumer food environment**

Fromage

**How the retail sector describes the problem**

Le café

**Policy options**



# Cost is a barrier to nutrition



- Food costs influence purchasing and diet quality
- **Healthier diets, on average, tend to cost more**
- Affordability of food within household budgets contributes to socioeconomic inequalities in diet, nutrition, and health
- Diet is a complex exposure variable (nutrients, foods, dietary patterns)

1. Bai Y, Alemu R, Block SA, Headey D, Masters WA. Cost and affordability of nutritious diets at retail prices: evidence from 177 countries. *Food policy*. 2021 Feb 1;99:101983.
2. Bai Y, Herforth A, Masters WA. Global variation in the cost of a nutrient-adequate diet by population group: an observational study. *The lancet planetary health*. 2022 Jan 1;6(1):e19-28.
3. Darmon N, Drewnowski A. Contribution of food prices and diet cost to socioeconomic disparities in diet quality and health: a systematic review and analysis. *Nutrition reviews*. 2015 Oct 1;73(10):643-60.
4. Rao M, Afshin A, Singh G, Mozaffarian D. Do healthier foods and diet patterns cost more than less healthy options? A systematic review and meta-analysis. *BMJ open*. 2013 Dec 1;3(12):e004277.
5. Darmon N, Drewnowski A. Contribution of food prices and diet cost to socioeconomic disparities in diet quality and health: a systematic review and analysis. *Nutrition reviews*. 2015 Oct 1;73(10):643-60.
6. Hu FB. Dietary pattern analysis: a new direction in nutritional epidemiology. *Current opinion in lipidology*. 2002 Feb 1;13(1):3-9.



# Gap between nutritious and currently consumed diets

- Linear programming studies: possible to **model theoretical diets from food supply that are low-cost**, and optimize nutrition parameters (or palatability, ecological sustainability, etc.); acceptability/feasibility unknown
- One prominent explanation for gap between nutritious and current diets is **FOOD ENVIRONMENT** i.e., **cheap**, readily available, convenient, energy-dense, nutrient-poor foods in an obesogenic environment  
(And noted disparities in exposure variation by SES/SEP)



1. Darmon N, Ferguson EL, Briend A. A cost constraint alone has adverse effects on food selection and nutrient density: an analysis of human diets by linear programming. *The Journal of nutrition*. 2002 Dec 1;132(12):3764-71.
2. van Dooren C. A Review of the Use of Linear Programming to Optimize Diets, Nutritiously, Economically and Environmentally. *Front Nutr*. 2018 Jun 21;5:48. doi: 10.3389/fnut.2018.00048. Erratum in: *Front Nutr*. 2022 May 13;9:850033. doi: 10.3389/fnut.2022.850033.
3. Masters WA, Finaret AB, Block SA. The economics of malnutrition: Dietary transition and food system transformation. *Handbook of agricultural economics*. 2022 Jan 1;6:4997-5083.



# Less nutritious intakes are the common intakes

We examined two illustrative intake pairs frequently focus of **consumer substitution-type** interventions: red meat (v. legumes); refined grains (v. whole grains)

Adults >19y CCHS-N 2015 (1<sup>st</sup> recall day, pumf), n=13,919  
**Findings: 2x refined grains v. whole, 4x red meat v. legumes;**  
consumers are already getting their ‘dose’; PT variation

**Table 2.** Proportion of the population who consumed the food group on their first 24 h recall day, by province and age–sex groups, 2015.

Covariate	Proportion of the population who consumed the food group on their first 24 h recall day (%) [95%CI]	
	Legumes	Red meat
<b>Overall</b>	12.3 [11.1, 13.7]	45.8 [44.3, 47.3]
<b>Province</b>		
British Columbia	13.1 [11.0, 15.6]	41.7 [37.9, 45.6]
Alberta	11.7 [9.0, 15.2]	49.6 [45.7, 53.5]
Saskatchewan	6.3* [4.4, 8.9]	48.5 [43.5, 53.6]
Manitoba	12.1 [9.2, 15.7]	45.9 [40.9, 50.9]
Ontario	14.3 [11.7, 17.3]	41.7 [38.6, 44.9]
Quebec	10.8 [9.1, 12.7]	52.8 [49.5, 56.1]
New Brunswick	6.2* [4.4, 8.8]	46.7 [42.3, 51.2]
Nova Scotia	11.3 [9.1, 14.1]	46.3 [41.9, 50.8]
Prince Edward Island	11.3 [8.3, 15.3]	43.5 [38.0, 49.2]
Newfoundland and Labrador	7.7 [5.7, 10.3]	43.1 [39.2, 47.2]

1. Luongo G, E Jago, and CL Mah. 2024. Assessing the potential for healthier consumer food substitutions in Canada: population-level differences in dietary intakes of whole grains, refined grains, red meats, and legumes. *Applied Physiology, Nutrition, and Metabolism*. 49(3): 340-349. <https://doi.org/10.1139/apnm-2023-0260>



# Critical issue: consumption of food is discretionary

- Typically studies of the economics of food selection have been based on neoclassical economics (bounded by caloric need, and budget as income)
- Research from poverty economics (multiple Nobel Prizes!), household food insecurity in Canada have shown **we must take as starting point that food consumption is discretionary** (i.e., not necessarily caloric ‘best buy’)
- In nutrition, emerging range of studies re: heterogeneity in cost sensitivity for certain foods by SES and SEP, as well as heterogeneity in role/importance of cost

1. Various: e.g., Sen 1983; Banerjee and Duflo 2004, 2007, 2011
2. Various: <https://proof.utoronto.ca/>; in particular Fafard St-Germain AA, Tarasuk V. Prioritization of the essentials in the spending patterns of Canadian households experiencing food insecurity. *Public Health Nutr.* 2018 Aug;21(11):2065-2078. doi: 10.1017/S1368980018000472.
3. Andreyeva T, Marple K, Moore TE, Powell LM. Evaluation of economic and health outcomes associated with food taxes and subsidies: a systematic review and meta-analysis. *JAMA Network Open.* 2022 Jun 1;5(6):e2214371-.
4. Andreyeva T, Marple K, Marinello S, Moore TE, Powell LM. Outcomes following taxation of sugar-sweetened beverages: a systematic review and meta-analysis. *JAMA Network Open.* 2022 Jun 1;5(6):e2215276-.
5. Hoenink JC, Waterlander W, Vandevijvere S, Beulens JW, Mackenbach JD. The cost of healthy versus current diets in the Netherlands for households with a low, middle and high education. *SSM-Population Health.* 2022 Dec 1;20:101296.





# Diet costs: Estimating individual-level cost of dietary intakes

- ‘**Diet cost**’ terminology by Drewnowski, Darmon et al.
- Proposed diet cost inversely associated with diet quality, particularly energy density of diet (also bidirectionality)
- Carlson/Davis critique: energy, autocorrelation problems
- Nevertheless: **method to attach ‘cost’ to individuals’ intakes** → importantly an individual **consumed-diet method**, not a modelled (theoretical) diet  
( → → **NOTE other approaches: e.g., nutritional quality of expenditures**)
- Importance of accurate estimation of **nutrient intakes** in diet-disease outcome associations

1. Luongo G, CL Mah (co-first authors), LE Cahill, M Hajizadeh, LJ Kennedy\*, H Wong\*, Y Yi, V Tarasuk. The relationship between diet costs and dietary adequacy: A scoping review of measures and methods with a focus on cost estimation using food supply data. J Nutr, accepted December 2024, in press
2. Drewnowski A, Specter SE. Poverty and obesity: the role of energy density and energy costs. AJCN. 2004 Jan 1;79(1):6-16.
3. Drewnowski A, Darmon N. Food choices and diet costs: an economic analysis. J Nutr. 2005 Apr 1;135(4):900-4.
4. Drewnowski A, Darmon N. The economics of obesity: dietary energy density and energy cost. AJCN. 2005 Jul 1;82(1):265S-73S.
5. Drewnowski A. Obesity, diets, and social inequalities. Nutrition Reviews. 2009;67(1):S36-S39. doi:10.1111/j.1753-4887.2009.00157.x.
6. Darmon N, Drewnowski A. Contribution of food prices and diet cost to socioeconomic disparities in diet quality and health: a systematic review and analysis. Nutrition reviews. 2015 Oct 1;73(10):643-60.
7. Appelhans BM, French SA, Tangney CC, Powell LM, Wang Y. To what extent do food purchases reflect shoppers’ diet quality and nutrient intake?. International Journal of Behavioral Nutrition and Physical Activity. 2017 Dec;14:1-0.



# Critical re-examination of diet cost methodology

G Luongo PhD thesis and CIHR PJT #162373

Household respondents from 2015 CCHS-N (PUMF<sup>1</sup> and RDC masterfile<sup>2</sup>) and CPI price lists

n=19,150 adults and children 4y+

1<sup>st</sup> 24-hour recall day; varied the geog. specificity, # of prices

**TABLE 1**

2015 CCHS-N food groups by consumption popularity and 2015 CPI food price availability.

	High CPI food price availability <sup>1</sup>	Low CPI food price availability
Commonly consumed <sup>2</sup>	<u>QUADRANT 1</u> Fats & oils Milk & dairy products Meat products Protein alternatives Grains Nonalcoholic beverages	<u>QUADRANT 2</u> Additions Fruits Vegetables Sweets
Not commonly consumed	<u>QUADRANT 3</u> Processed meats Breakfast cereals Entrees Baby food Finfish and shellfish products	<u>QUADRANT 4</u> Baked products Snacks Alcoholic beverages

Abbreviations: CCHS-N, Canadian Community Health Survey-Nutrition; CPI, Consumer Price Index.

<sup>1</sup> High CPI food price availability = above the median proportion of CPI coverage (79.2%).

<sup>2</sup> Commonly consumed = above the mean proportion of overall food groups consumed on the first 24-h recall (57.9%).

Reasonable/feasible for diet costing, but undercoverage of commonly consumed yet nutritionally significant foods

1. Luongo G, Tarasuk V, Yi Y, Mah CL. Feasibility and measurement error in using food supply data to estimate diet costs in Canada. Public Health Nutr. 2022 Mar 9;25(6):1-33. doi: 10.1017/S1368980022000532.
2. Luongo G, Tarasuk V, Cahill LE, Hajizadeh M, Yi Y, Mah CL. Cost of a Healthy Diet: A Population-Representative Comparison of 3 Diet Cost Methods in Canada. J Nutr. 2024 Nov;154(11):3424-3436. doi: 10.1016/j.tjnut.2024.09.002.



A - Adults  
B - Children

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A

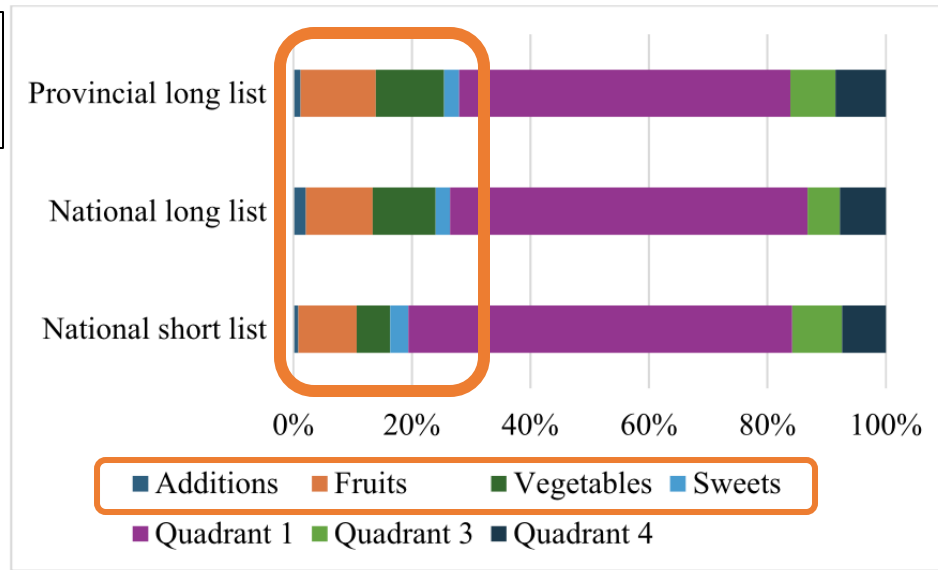
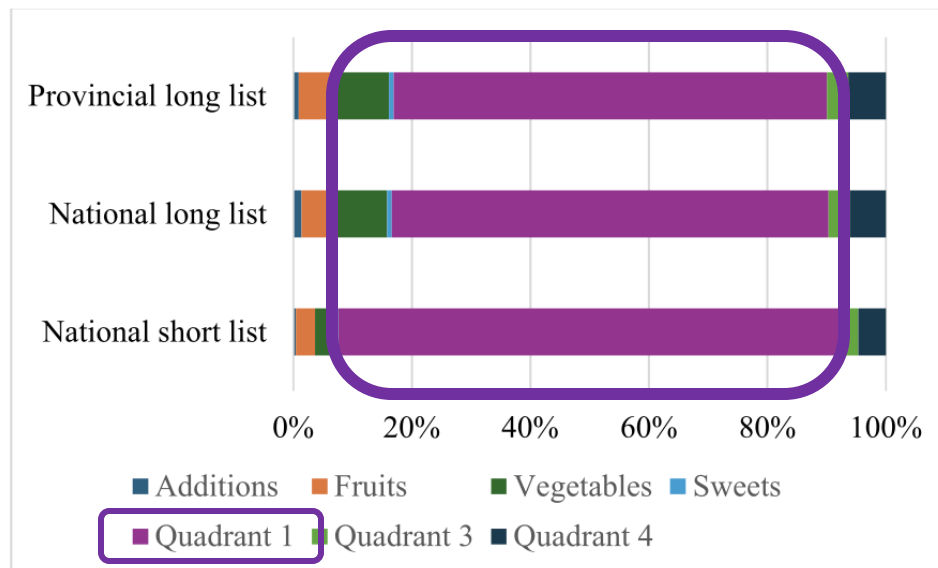


FIGURE 1. Proportion of energy-adjusted diet costs by Consumer Price Index price availability and consumption frequency quadrants, by diet costing method, by age group, 2015. (A) Children, aged 4-18 y. (B) Adults, aged  $\geq 19$  y.

B



Consider dollar values:

- Rao et al. 2013 meta-analysis detected **~\$1.50/d differences between less healthy and healthier diets**
- Our study: without energy adjustment, avg. daily diet cost (all ages 4+) were **\$12.49** (95% CI: 12.19, 12.79) using the **national short list**, **\$10.04** (95% CI: 9.87, 10.22) using the **national long list**, and **\$9.78** (95% CI: 9.60, 9.95) using the **provincial long list**.
- Differences for adult, child, **by food groups!**



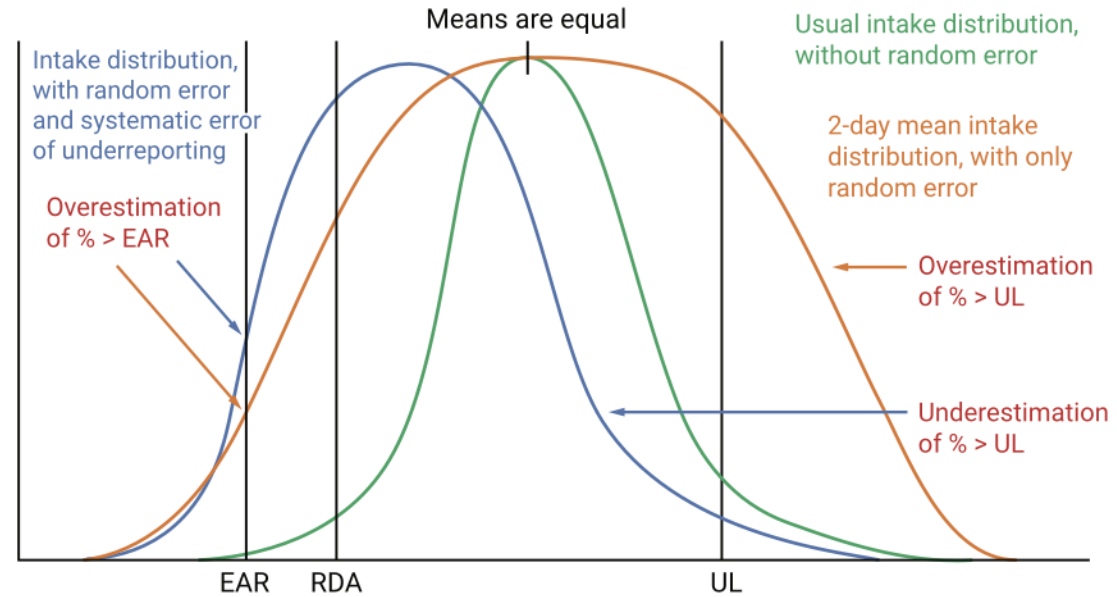
## Price is an indicator of demand; food environment is a dynamic exposure

- Rapidly changing, digitized food environment
- Web-scraped economic studies of online ‘demand’ have **anticipated price change relative to offline audits**, and detected digital food **price dispersion (i.e., variation among sellers in \$ price set for the same item)** within and among jurisdictions, stores, barcode unit of analysis
  - May explain mixed findings re: food cost exposures in observational nutrition environment studies
- **Retailer scanner-data CPIs** as emerging global standard; StatCan CPI food aggregate transitioned ~2015-2017

1. Hillen J. Web scraping for food price research. *British Food Journal*. 2019 Nov 27;121(12):3350-61.
2. Cavallo A, Rigobon R. The billion prices project: Using online prices for measurement and research. *Journal of Economic Perspectives*. 2016 May 1;30(2):151-78.
3. Cavallo A. Are online and offline prices similar? Evidence from large multi-channel retailers. *American Economic Review*. 2017 Jan 1;107(1):283-303.
4. Taylor NGA, Luongo G, Jago E, Mah CL. Observational study of population level disparities in food costs in 2021 in Canada: A digital national nutritious food basket (dNNFB). *Prev Med Rep*. 2023 Feb 23;32:102162. doi: 10.1016/j.pmedr.2023.102162
5. Kostyshyna O, Ouellet M. Household food inflation in Canada. Ottawa: Bank of Canada, 2024.
6. ILO (International Labour Organization). *Consumer Price Index Manual, 2020: Concepts and Methods*.
7. Ottawa Group on Price Indices <https://unstats.un.org/unsd/methodology/citygroups/ottawa.cshtml>



# ‘Public health decisions are made at the tails of the distributions’



← from Bailey and Jun 2021

**FIGURE 1** Hypothetical distributions of dietary intakes highlighting the impact of measurement error at the tails of the distribution. Reproduced with permission from Bailey et al. (7). EAR, Estimated Average Requirement; UL, Tolerable Upper Intake Level.

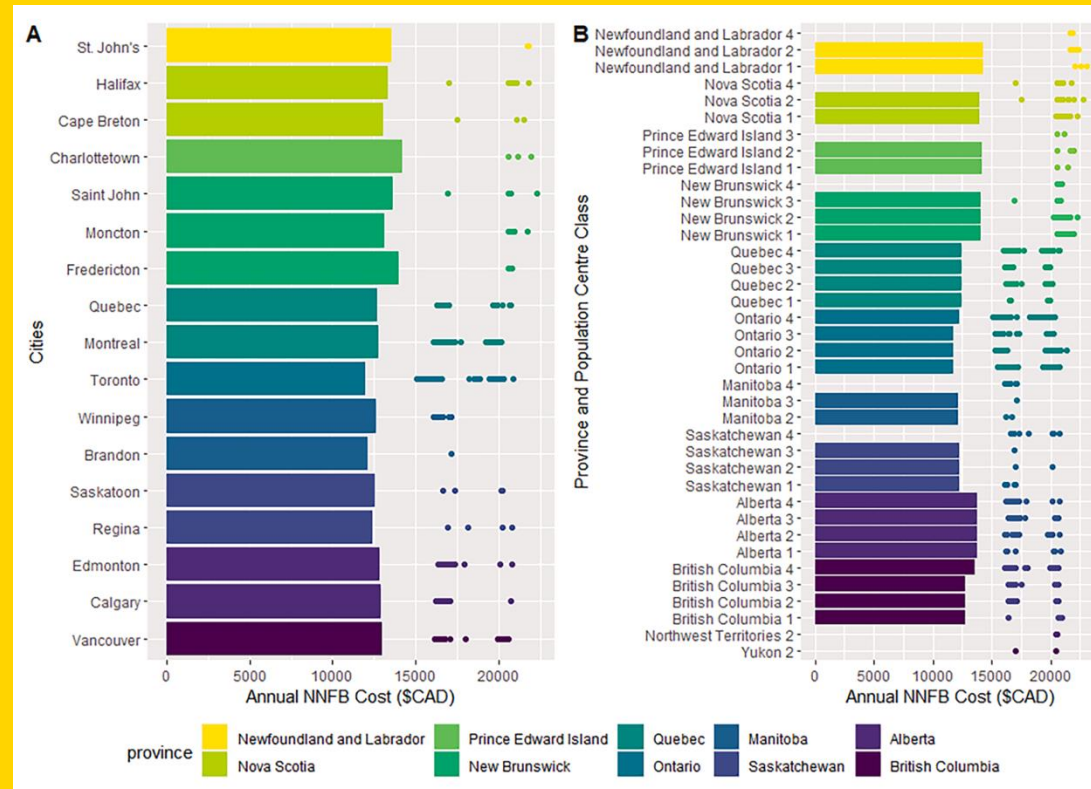
1. Bailey RL, Jun S. Public Health Decisions Are Made at the Tails of the Distribution: A Novel Tool to Estimate Usual Intake Distributions from Short-Term Dietary Assessment Methods. *The Journal of Nutrition*. 2021 May 1;151(5):1059-60.
2. Rochefort G, Brassard D, Paquette MC, Robitaille J, Lemieux S, Provencher V, Lamarche B. Adhering to Canada's Food Guide Recommendations on Healthy Food Choices Increases the Daily Diet Cost: Insights from the PREDISE Study. *Nutrients*. 2022 Sep 16;14(18):3818. doi: 10.3390/nu14183818.



# Role of consumer food environment: distribution of cost exposures

Series of studies (N Taylor x G Luongo PhD theses collab) to design purpose-built grocery price web-scraper

Test use cases: a digital NNFB; a Bureau of Nutritional Sciences (BNS)-code price database



n=751 stores (11 discount and regular banners in all P/Ts except Nunavut)

- 2019 NNFB (61 foods)
- 5,778 food items with over 15,000 distinct prices returned

## Comparing apples to apples!

- Matching algorithm: 184 discrete products (SKU) used to compute dNNFB weekly basket costs for reference family
- Nov 2021, inflation-adjusted (provincial variation in CPI)

- Most expensive: Dominion in NL (\$418.33/wk); largest within-provinces differences in Atlantic Canada (\$76.37/week)
- dNNFB estimates differed from the MBM by ~\$4,200 to ~\$6000 per year
- **Price 'discrimination'**; further analysis shows prices vary by region, **banner**

1. Taylor NGA, Luongo G, Jago E, Mah CL. Observational study of population level disparities in food costs in 2021 in Canada: A digital national nutritious food basket (dNNFB). Prev Med Rep. 2023 Feb 23;32:102162. doi: 10.1016/j.pmedr.2023.102162





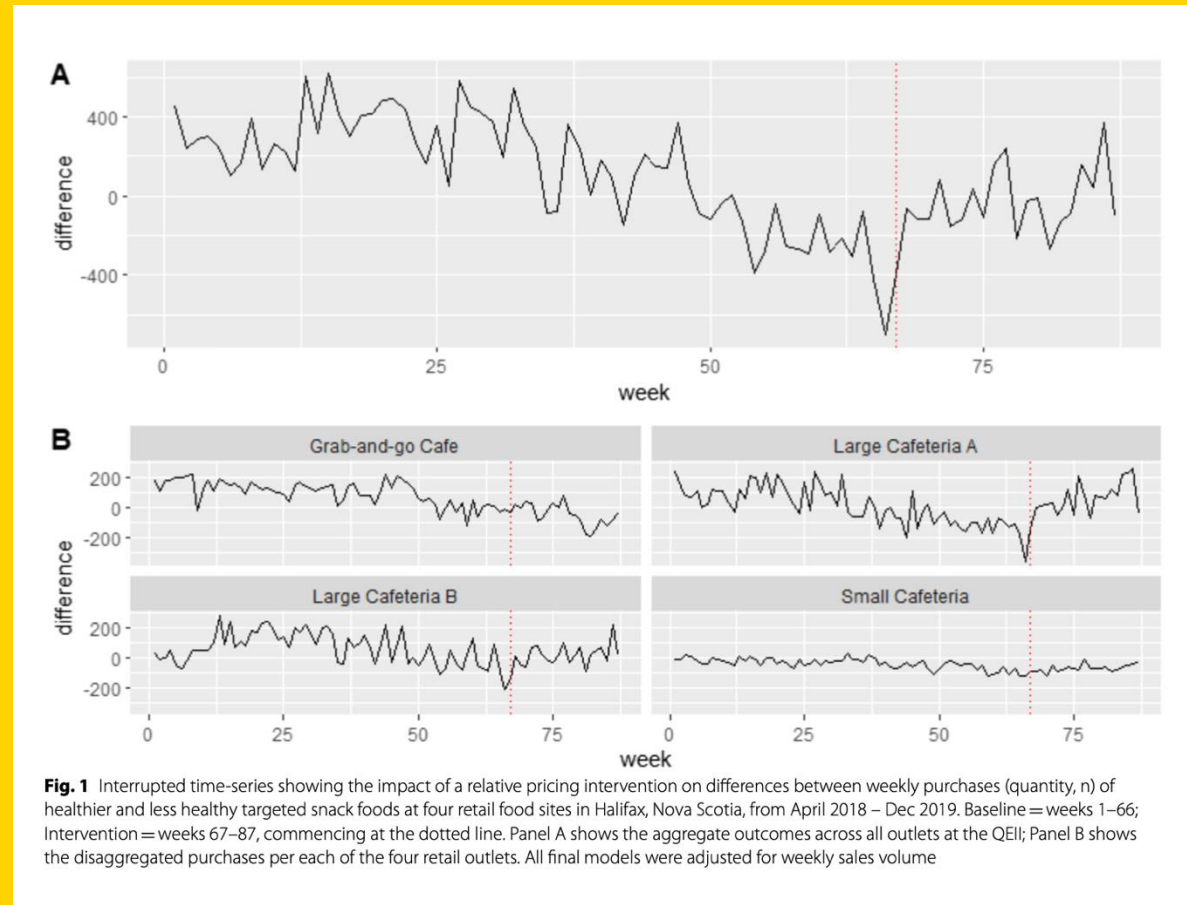
## Role of consumer food environment: price salience effects via related merchandising

Evaluating Nova Scotia Health price change + salience merchandising, on nutritional quality of snack purchases ('switching')

Relative price intervention: raise price for less nutritious option; lower price for nutritious

→ Upcoming: CIHR FRN #189950

**Findings: intervention 'worked'** (but no comparison group; duration?; in-house baked goods as a confounder?)



1. Mah CL, Kennedy L, Taylor NGA, Nicholson T, Jago E, MacDonald B. Effect of a relative pricing intervention and active merchandising on snack purchases: interrupted time series analysis of a hospital retailer-led strategy. *Int J Behav Nutr Phys Act.* 2023 May 4;20(1):56. doi: 10.1186/s12966-023-01426-0.



# Wide variation in how food supply prices used in diet costing literature

JB1 scoping review method, focusing on Drewnowski/Darmon individual consumed-diet method attaching food prices to dietary intakes

n=55 included studies, published 1999-2022 from 17 countries (15 US papers)

The Journal of Nutrition  
Available online 24 December 2024  
In Press, Journal Pre-proof ? What's this?

Global Nutrition Security, Environment and Climate, and One Health

## The relationship between diet costs and dietary adequacy: A scoping review of measures and methods with a focus on cost estimation using food supply data

Gabriella Luongo<sup>1</sup> ✉, Catherine L. Mah<sup>1a</sup>, Leah E. Cahill<sup>2</sup>, Mohammad Hajizadeh<sup>1</sup>, Laura J. Kennedy<sup>1</sup>, Helen Wong<sup>1</sup>, Yanqing Yi<sup>3</sup>, Valerie Tarasuk<sup>4b</sup>

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- All studies derived diet costs from attached food prices collected separately (most = **retail audits**). Common arithmetic for diet cost est.
- 31 papers (56%) used FFQ; 15 used 24h recall
- 21 papers addressed energy underreporting
- Only 19 papers (35%) reported # food prices used (wide range: 57 to 4,600 prices)
- 27 papers (49%) included at least one SES covariate (but typically annual household\* income)
- Only 2 papers used location of residence to match prices to intakes
- **Much potential for bias in cost estimation (both directions)!**

1. Luongo G, CL Mah (co-first authors), LE Cahill, M Hajizadeh, LJ Kennedy\*, H Wong\*, Y Yi, V Tarasuk. The relationship between diet costs and dietary adequacy: A scoping review of measures and methods with a focus on cost estimation using food supply data. Journal of Nutrition, accepted December 2024, in press



THE RISE IN PRICES  
AND THE  
COST OF LIVING IN CANADA, 1900-1914

INTRODUCTION.

At the outset of any inquiry into a subject so many-sided as the present, it is essential to define its scope, that is, to discuss the precise meaning to be attached to the term "cost of living," otherwise its very familiarity may prove a pit-fall, where so much depends upon clearness and accuracy of expression.

BOARD OF INQUIRY  
INTO  
COST OF LIVING IN CANADA

REPORT OF THE BOARD

VOLUME II



OTTAWA  
PRINTED BY J. DE L. TACHÉ, PRINTER TO THE KING'S MOST  
EXCELLENT MAJESTY  
1915.

National food cost measurement predates the existence of Statistics Canada – first government statistics in the early 1900s in Canada and US; royal commission 1915!

Policy: labour relations, need for impartial facts on cost-of-living

# Historical context



## Recap: contemporary government-collected measures mentioned thus far in the talk

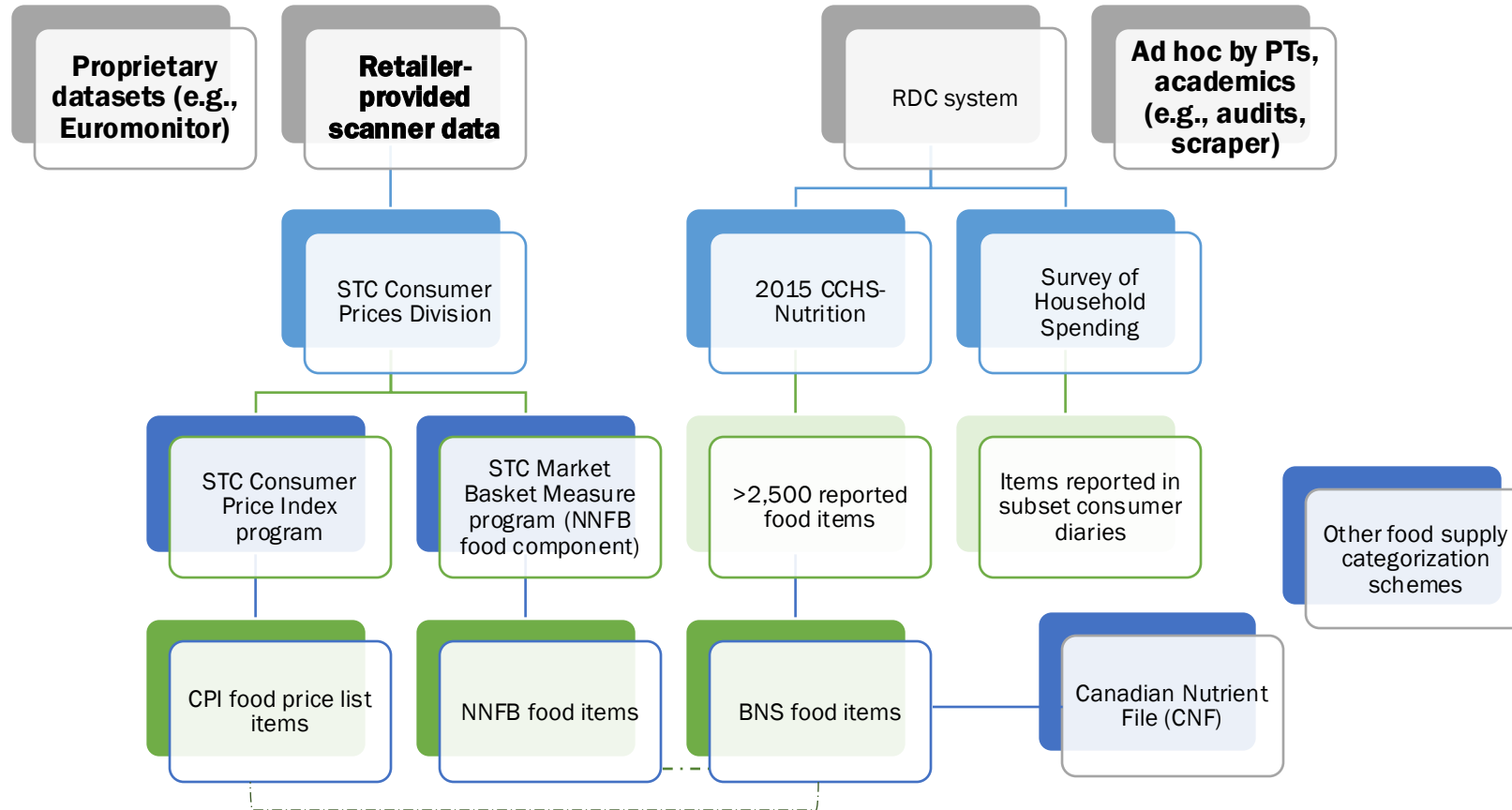
Challenges in **designing policy instruments to close gap between nutritious and currently consumed diets**

Measure	Description, purpose	Policy instruments and broad examples of normative goals
<b>CPI (index)</b>	Price <u>index</u> for macroeconomic policy (monetary system, financial regulation, currency exchange etc.)	Economic regulation <ul style="list-style-type: none"> <li>E.g., high labour productivity, full employment, price stability</li> </ul> Social assistance <ul style="list-style-type: none"> <li>E.g., maintain contribution to cost/standard of living</li> </ul>
<b>CPI (prices)</b>	Public reporting of sample prices from food CPI	Communication, exhortation <ul style="list-style-type: none"> <li>E.g., transparency</li> </ul>
<b>Market Basket Measure (NNFB = food component)</b>	Consumer ‘basket’ and Canada’s new poverty ‘line’ (since 2019). Representative commonly consumed, nutritionally reasonable foods.	Social regulation <ul style="list-style-type: none"> <li>E.g., reducing poverty, reducing social exclusion, ‘social sorting’ of citizens, consumption <b>standard</b>. NOTE! <u>Not</u> cost-of-living, <u>not</u> ‘basic needs’, <u>not</u> a diet, <u>not</u> a nutritious diet, <u>not</u> a grocery shopping list</li> </ul>
<b>HFSSM (food insecurity)</b>	Household nonmonetary material deprivation indicator, poverty dashboard	Social assistance, surveillance <ul style="list-style-type: none"> <li>E.g., quality of life thresholds, reduce health risk burden</li> </ul>
<b>CCHS-N 24h recall</b>	Household respondent, APNM, pop. diet intake	Nutritional surveillance <ul style="list-style-type: none"> <li>E.g., reduce micronutr deficiencies</li> </ul>

... Consider other ‘admin’ data e.g., hospital sales data!



# Patchwork of datasets, research perspective



... with apologies for the visual communication clarity of my flowchart

## Canada food cost data: consumption monitoring (economic) is the priority

→ Crosswalks are needed for nutrition! No standardized list of food items exists for which food/nutrient composition and prices are readily attached.

- Even CPI and MBM must adjust for product 'churn'

Compare US examples:

- CNPP \$ dataset (2012)
- USDA Purchase-to-Plate suite, etc. (Carlson and colleagues)



# How does this relate to food insecurity

Significance of rapid inflation, other price volatility, and cost of a healthy diet for poverty and household food insecurity.

→ E.g., how budget is allocated to essentials; disproportionate inflation for low cost 'budget' goods.

Cost 'burden' not equally distributed, heterogeneity

→ E.g., role of education, wealth assets

**HFI = nonmonetary material deprivation as well as forms of social (structural) exclusion**

*More soon! Book chapter, and paper under review with L McIntyre*



# How retail food sector describes the problem



- Food retailing is a low margin industry sector (i.e., narrow range of potential margins)
- Food is an essential need, but retail grocery provides food across varied **societal values around food choice**, as well as **social/socioeconomic differentiation** in price ceilings (value growth)
- Post-2008 and post-COVID inflation have shifted what average consumers can pay, and are willing to allocate budget toward (e.g., ‘downtrading’)
- Rapidly evolving ‘omnichannel’ and touchpoints situation for online food purchasing
- Personalized merchandising is the new norm (but there is tension in rising social atomization)

1. Competition Bureau of Canada. Canada Needs More Grocery Competition: Competition Bureau Retail Grocery Market Study Report. Ottawa: Innovation, Science and Economic Development Canada, 2022
2. Bank of Canada. Canadian Survey of Consumer Expectations—Third Quarter of 2024. Ottawa: 2024



# Policy area 1: High-quality objective information

Purposeful public investments in the **security, quality, objectivity, and transparency** of digital food cost information with nutrition in mind.

**Economic monitoring is not currently nutrition-sensitive.**

EXAMPLES (\*\*caution in politicization\*\*):

- Strengthen Consumer Price Indices using scanner data—regulatory framework; evidence needed on diet cost biases (e.g., recall common consumption is not nutritious diet)
- Acceptability and feasibility of reference diets given food supply, capturing heterogeneity
- Robust individual or household-respondent nutritional (dietary) surveillance surveys, with potential to attach food cost; food (nutrient) composition data that can be costed
- Secure public microdata sources for research!

1. Luongo G, Tarasuk V, Yi Y, Mah CL. Feasibility and measurement error in using food supply data to estimate diet costs in Canada. *Public Health Nutrition*. 2022 Jun;25(6):1607-18.
2. Luongo G, Tarasuk V, Cahill LE, Hajizadeh M, Yi Y, Mah CL. Cost of a Healthy Diet: A Population-Representative Comparison of 3 Diet Cost Methods in Canada. *The Journal of Nutrition*. 2024 Nov 1;154(11):3424-36.



## Policy area 2: Retailing for nutrition

Retailing influences social and place-based norms for nutritious foods. **Merchandising is not currently nutrition-sensitive.**

### EXAMPLES:

- Value chain approaches to stem harms from least nutritious foods, e.g., aggressive discounting
- Targeted public investments to reduce dietary impacts of retail inequalities—reducing emphasis on behaviour change communication.
- Heterogeneity in diet costs may result from absolute differences in price of foods or relative prices, as well as how consumers allocate budget to those foods → evidence points to need to explore **regional-cost sensitive social protection in Canada.**

More and see references on next slides →→→



## Policy area 2: Retailing for nutrition

Retailing influences social and place-based norms for nutritious foods. **Merchandising is not currently nutrition-sensitive.**

### EXAMPLES:

- Likely a limited role for incentives and neighbourhood-level intervention (e.g., planning, licensing, development), where relevant may be leveraging social role of the retailer
- Questionable value (for diet costs) of very broad food supply cost intervention (e.g., tax holidays ... )
- Much greater attention is needed to SES/SEP heterogeneity in fiscal interventions, consider most recent examination of soda taxes (Andreyeva et al. reviews for WHO), evidence of influence on purchasing but not yet for dietary improvement
- Researcher cooperation on methods and metrics within rapidly changing digital food environment.

More and see references on next slide →→→





## Policy area 2: Retailing for nutrition

Retailing influences social and place-based norms for nutritious foods. **Merchandising is not currently nutrition-sensitive.**

### EXAMPLES

- Attention to data quality and objective measures; critical perspectives on social policy targeting. Pros AND cons of reliance on proprietary cost, expenditure/sales data. Not a replacement for gov.

1. Mah CL, Luongo G, Hasdell R, Taylor NG, Lo BK. A systematic review of the effect of retail food environment interventions on diet and health with a focus on the enabling role of public policies. *Current Nutrition Reports*. 2019 Dec;8:411-28.
2. Atanasova P, Kusuma D, Pineda E, Frost G, Sassi F, Miraldo M. The impact of the consumer and neighbourhood food environment on dietary intake and obesity-related outcomes: A systematic review of causal impact studies. *Social science & medicine*. 2022 Apr 1;299:114879.
3. Alsubhi M, Blake M, Nguyen T, Majmudar I, Moodie M, Ananthapavan J. Consumer willingness to pay for healthier food products: A systematic review. *Obesity Reviews*. 2023 Jan;24(1):e13525.
4. Rinaldi C, McGill E, Petticrew M, Knai C, Egan M. High street retail environment interventions and their theorised impacts on health and wellbeing: A scoping review. *PloS one*. 2024 Nov 14;19(11):e0312826.
5. Burton R, Sharpe C, Bhuptani S, Jecks M, Henn C, Pearce-Smith N, Knight S, Regan M, Sheron N. The relationship between the price and demand of alcohol, tobacco, unhealthy food, sugar-sweetened beverages, and gambling: an umbrella review of systematic reviews. *BMC Public Health*. 2024 May 10;24(1):1286.
6. Turner G, Green R, Alae-Carew C, Dangour AD. The association of dimensions of fruit and vegetable access in the retail food environment with consumption; a systematic review. *Global Food Security*. 2021 Jun 1;29:100528.
7. Andreyeva T, Marple K, Moore TE, Powell LM. Evaluation of economic and health outcomes associated with food taxes and subsidies: a systematic review and meta-analysis. *JAMA Network Open*. 2022 Jun 1;5(6):e2214371-.
8. Andreyeva T, Marple K, Marinello S, Moore TE, Powell LM. Outcomes following taxation of sugar-sweetened beverages: a systematic review and meta-analysis. *JAMA Network Open*. 2022 Jun 1;5(6):e2215276-.



## Policy area 3: Resetting the social contract

Poverty reduction, household food insecurity reduction, reduce economic inequality, and invest in a healthy labour force. **Prosperity is not currently nutrition-sensitive.**

### EXAMPLES:

- Cost-of-living (CPI is not) vs. standard-of-living indices
- Deprivation indices accounting for material AND social
- Life-course approaches to social insurance, cash and tax transfers, and strengthening labour force attachment remain key instruments for improving population nutrition
- Need a much stronger evidence base on distribution of costs, and contribution of exposures such as wealth assets to socioeconomic inequalities in diet, nutrition, and health

1. Idzerda L, Corrin T, Lazarescu C, Couture A, Vallières E, Khan S, Tarasuk V, McIntyre L, Garcia AJ. Public policy interventions to mitigate household food insecurity in Canada: a systematic review. *Public Health Nutrition*. 2024 Jan 15:1-21.
2. Men F, St-Germain AA, Ross K, Remtulla R, Tarasuk V. Effect of Canada child benefit on food insecurity: a propensity score– matched analysis. *American journal of preventive medicine*. 2023 Jun 1;64(6):844-52; for numerous other examples within Canada's welfare state please see also: <https://proof.utoronto.ca/>



# Critically deconstructing the ‘cost’ of a healthy diet



TERM	WORKING RELATIONAL DEFINITION FOR NUTRITION
<b>Food price</b>	Observed \$ value attribute of food items in the food supply/environment, i.e., theoretical (unrealized) expenditure
<b>Price index</b>	Indicator estimating price change, jurisdictional and temporal bounds
<b>Food cost</b>	Relational observed \$ value attribute of food items at purchase, bounded by the conditions of purchase, i.e., “the cost of this item to an individual or household”; the experience of food prices by a consumer
<b>Food expense</b>	Observed \$ value outlay exchanged by an individual or household to seller(s) to obtain a food item, i.e., purchases. <b>Affordability</b> = relative to budget, norms, consumption threshold, etc.
<b>Food basket</b>	Derived \$ value of a model or theoretical consumer ‘basket’ of goods/services, typically derived from population consumption estimates (avg. intakes OR expenditures). Often embeds specific <b>public policy assumptions</b> . May, but often does not, reflect a <b>diet</b> . E.g., Nutritious Food Basket; Thrifty Food Plan; FAO CoAHD indicator
<b>DIETCOST</b>	Computer program by the University of Auckland to derive cost estimates for model food baskets, or model diets
<b>Diet cost</b>	Derived \$ cost estimate of an individual’s dietary intakes, based on dietary assessment, typically \$/day, may be adjusted for energy

1. Luongo G, CL Mah (co-first authors), LE Cahill, M Hajizadeh, LJ Kennedy\*, H Wong\*, Y Yi, V Tarasuk. The relationship between diet costs and dietary adequacy: A scoping review of measures and methods with a focus on cost estimation using food supply data. *Journal of Nutrition*, accepted December 2024.
2. Taylor NGA, Luongo G, Jago E, Mah CL. Observational study of population level disparities in food costs in 2021 in Canada: A digital national nutritious food basket (dNNFB). *Prev Med Rep.* 2023 Feb 23;32:102162. doi: 10.1016/j.pmedr.2023.102162



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