One-Carbon Metabolism Nutrient Intakes among Canadian Women of Childbearing Years: Findings from the 2015 Canadian Community Health Survey – Nutrition

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Introduction

- Adequate intake of one-carbon (1C) metabolism nutrients are vital for normal fetal development.
- The key nutrients involved in 1C metabolism are folate, choline, vitamins B₆ and B₁₂.
- While the importance of periconceptual folate intake has been well established as a public health approach to neural tube defect (NTD) reduction, growing evidence suggests inadequate intakes of choline and vitamins B₆ and B₁₂ are also linked to NTD risk. ^{1,2}
- Currently, limited research exists which examines 1C intakes among Canadian women of childbearing years (WCBY).

Objectives

- 1) Determine dietary intakes of folate, choline, vitamins B₆ and B₁₂ among WCBY.
- 2) Derive the percent contribution of the top food sources for each 1C nutrient among WCBY.

Methods

- Nationally representative dietary data from 24-h recalls collected in the Canadian Community Health Survey Nutrition – 2015 were analyzed to determine intake and food sources of folate, choline, vitamins B₆ and vitamin B₁₂ among non-pregnant and non-lactating Canadian women aged 18-44 years old (n=2429). Nutrient intake from supplements was not included in the analysis.
- CCHS-Nutrition 2015 does not contain nutrient-content values for choline. The authors created a comprehensive choline database by matching food codes to the 2015 version of the Canadian Nutrient File (CNF).³ Foods not included in the CNF were manually coded by matching with nutritionally comparable foods.
- Percent contributions were estimated for all food sources contributing to intake of each 1C nutrient.
- All statistical analyses were conducted using SAS for Windows (version 9.4: SAS Institute).

Results

1. Mean Daily 1C Nutrient Intake

Table 1. Mean daily one-carbon nutrient intake in Canadian women of childbearing years according to CCHS 2015-Nutrition data

Nutrient	EAR/AI	Mean intake (±SE) ¹
B ₁₂	2.0 µg/d	3.7 ± 0.2
B ₆	1.1 mg/d	1.5 ± 0.03
Folate	320 µg/d DFE	523 ± 11.9
Choline	425 mg/day (AI)	243 ± 5.5

¹ Mean ± SE. Generated using survey means. N=2429, Non-pregnant, non-lactating women aged 18 to 44 yrs.

3. Food Sources of Choline

Table 2. Top 10 foods contributing to dietary intake of choline in Canadian women of childbearing years according to CCHS 2015-Nutrition data

Ranking	Food	Percent Contribution
1	Eggs	15.5%
2	Chicken	8.5%
3	2% Milk	5.1%
4	Ground Beef	4.0%
5	Coffee	3.3%
6	Cereal Grains and Flours	2.8%
7	1% Milk	2.7%
8	Onions, green onions, leeks, garlic	2.3%
9	Tomatoes	2.0%
10	Chicken	1.9%

2. Dietary Sources Contributing to 1C Intake

Conclusions

- A large portion of Canadian WCBY are meeting current nutrient recommendations for folate, vitamin B₆ and vitamin B₁₂.
- While food sources for choline are primarily animal in origin, the majority of women are not meeting the AI for choline.
- Given the importance of choline in pregnancy, strategies are needed to improve intake.

References

1. Simpson et al. J Matern Fetal Neonatal Med. 2010;23(12):1323
2. Shaw et al. Epidemiol. 2009;20(5): 714
3. Health Canada. The Canadian Nutrient File. 2015.

Significance to Dietetics

Dietitians need to focus not only on folate consumption in WCBY but choline as well. Top food sources of choline should be considered as a strategy to improve dietary intake among women.