

PRO0916
<i>Pulse consumption in Canada: Analysis of pulses in the Canadian Community Health Survey (CCHS)</i>
INVESTIGATORS
Principal Investigator: Dr. Harold Aukema, University of Manitoba
STUDY SPONSORS
Saskatchewan Pulse Growers Pulse Innovation Project, through Canada's Agricultural Policy Framework (APF)
TYPE OF STUDY
Health Outcomes: Dietary Intake Analysis
OBJECTIVES
<p>To examine the prevalence and the effect of pulse consumption on nutrient intake in Canadian adults (>19yrs) by evaluating the food-specific data collected during the 2004 Canadian Community Health Survey.</p> <p><u>Primary outcome:</u></p> <ul style="list-style-type: none"> a) Identify demographic characteristics of Canadian adult pulse consumers b) To evaluate diet quality (nutrient and food group intakes) of Canadian pulse consumers relative to non-consumers <p><u>Secondary outcome:</u></p> <ul style="list-style-type: none"> c) To determine if other health outcomes (biomarkers, disease diagnosis) or weight status is related to pulse consumption.
WHY STUDY NEEDED
<p>There is limited data describing pulse consumption among populations in North America and implications for nutrient intake and diet quality are sparse. Food consumption patterns overall among Canadians is particularly limited. The Canadian Community Health Survey (CCHS) Cycle 2.2, is a cross sectional survey of information related to health status and health determinants (including diet) and offers an opportunity to address many nutrition and health-related questions with implications for maintaining and improving the populations health. The last national food consumption survey conducted among Canadians was between 1970 and 1972.</p> <p>In the United States, analysis of pulse consumption was evaluated using the National Health</p>

and Nutrition Examination Study (NHANES) where the research suggested increased consumption of pulses could significantly improve diet quality. Examining similar issues within the CCHS will provide data on the Canadian situation and enhance knowledge of dietary consumption of pulses in Canada.

HYPOTHESIS

Based upon similar population studies it is hypothesized that the overall diet quality of pulse consumers will be healthier than non-consumers and that nutrient intake (fiber, folate, protein, iron and zinc) and quality of food intake will be enhanced among pulse consumers. It is hypothesized that a higher level of pulses in the diet may also be linked to lower incidence of obesity and a healthier body mass index (BMI).

STUDY DESIGN

The study used data available from the Canadian Community Health Survey (Cycle 2.2) in which food intake was collected via 24 hour recall during 2004. The purpose of the CCHS was to gather information on the dietary intake and nutritional well-being of Canadians and to inform and guide future policies and guidelines of both government and local health agencies. A national response rate of 76.5% was achieved. Full details of how the CCHS was conducted are available on the Statistics Canada website. Data from the CCHS is available through specified Research Data Centres.

Cross sectional data was analyzed from this 2004 CCHS Cycle 2.2. Study. Sample weights were applied and logistic regression analysis was used to explore the association of nutrient intakes and pulse consumption with cultural background, sex, age, and economic status taken as covariates. Pulse consumers were defined as respondents who consumed at least one pulse food or a pulse containing food product during the one day dietary recall.

FINDINGS

1. On any given day, 13.1% of Canadian adults in 2004 consumed dry beans, peas, or lentils, similar to the US population.
2. The pulse intake of consumers in the highest quartile was 295 ±40 g/day.
3. Pulse intake was highest in New Brunswick and lowest in Quebec. Ontario and British Columbia had the highest proportions of pulse consumers as residents.
4. The highest proportions of pulse consumers fell into the 51-70 age bracket.
5. Asian Canadians were 3.6 times more likely to be pulse consumers than Caucasian, with those participants identifying themselves as Arabic, Latin, African Canadian, or of multiple cultural origins being 1.6 times more likely to be pulse consumers than Caucasian.
6. Gender, income, education level, and community type (urban versus rural) were not significant determinants of pulse intake.
7. Mung beans were the popular pulse in the Canadian survey, compared to pinto and refried beans in the US; the difference most likely attributed to the differences in the Hispanic population (1% Canada, 16% US) and Asian population (10% Canada, 5% US) between countries.
8. In Canada, the nutrient intake which improved the most with pulse consumption was fiber, with those consumers in the highest quartiles of pulse consumption consuming twice as much as non-consumers.

9. More micronutrients (folate, calcium, magnesium, iron, potassium, and zinc) were consumed by pulse eaters.
10. Concerns with higher pulse intakes were the higher levels of sodium and the lower levels of vitamin B12 found in the diet. Both observations need further investigation to determine why.
11. Although BMI was higher in pulse consumers, there was no statistical significant difference in body mass index between consumers and non-consumers.
12. Overall, pulse consumption lead to improved diet quality.

However the above interpretations must be taken with caution as there were a number of limitations noted with the CCHS:

1. Is based on a single reference day for dietary intake
2. Not all populations groups in Canada represented in study
3. Diet type not noted (vegetarian, low-carbohydrate, vegan etc)
4. Subtle differences in food composition (formulation, processing) not reflected in Canadian Nutrient File

SIGNIFICANCE OF STUDY

Analysis of the CCHS 2.2, 2004 showed that an increase of dry beans and peas is associated with higher intakes of fibre, protein, carbohydrate, folate, magnesium, iron, potassium and zinc leading to improved dietary quality.

PUBLICATIONS, PRESENTATIONS, EDUCATIONAL MATERIALS PRODUCED

Ms. Mudryj completed this project, and has published a paper, a thesis, two abstracts and made three presentations on these results.

The following publications and presentations resulted from this work:

Thesis:

Mudryj A. Pulse consumption in Canada: Analysis of pulse consumption in the Canadian Community Health Survey

Peer-reviewed manuscript:

Mudryj AN, Yu N, Hartman TJ, Mitchell DC, Lawrence FR, Aukema HM. 2012. Pulse Consumption in Canadian Adults Influences Nutrient Intakes. Br J Nutr 108: S27-S36. 4

Presentations:

1. Presentation given by Ms Mudryj at the annual meeting of the Canadian Nutrition Society, June 2011, Guelph

Abstract: Mudryj AN, Yu BN, Hartman TJ, Mitchell DC, Lawrence FR, Aukema HM. Nutrient intakes and dietary patterns of adult Canadian pulse consumers. Appl Physiol Nutr Metab 36: 471, 2011

2. Presentation given by Ms Mudryj at the annual meeting of Experimental Biology, April 2011, Washington, DC

Abstract: Mudryj AN, Yu BN, Hartman TJ, Mitchell DC, Lawrence FR, Aukema HM. Consumption of Pulses Is Associated With Improved Diet Quality in Canadians. FASEB J 25:770.13, 2011

3. Pulse Canada reported the findings of this project in the April 2012 edition of Pulse News Network (<http://www.pulsecanada.com/pnn/nutrition/2012/april/pulse-competition-canadian-adults-improves-intakes-full>)

4. Pulse Canada hosted a webinar on March 15, 2012 in which Ms Mudryj presented the findings of this project (<http://www.pulsecanada.com/news-multimedia/webinars>)

VALUE TO PRODUCERS

Dietary intake analysis of the 2004 CCHS showed that only 13% of Canadian consumers ate pulses.

The data provides an opportunity for the pulse industry to create ways to increase awareness and consumption of pulses particularly as the analysis shows that pulse consumption can improve dietary quality.

This analysis serves as a benchmark for future dietary intake studies, in order to determine if pulse consumption is increasing.