

## Attitudes and health behaviours of young adolescent omnivores and vegetarians: A school-based study<sup>☆</sup>

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### Abstract

This study aimed to identify attitudes, health behaviours, social adjustment and self-reported health of vegetarian and omnivore teenagers and determine characteristics independently related to vegetarian status. Participants were 630 Grade 9 students, ages 13–15 years, in seven schools in Ontario, Canada. Vegetarian status was determined using a 19-item food inventory. The vegetarian group included lacto, ovo and/or lacto–ovo and semi-vegetarians. Omnivores consumed red meat at least monthly. Social adjustment factors included school misbehaviour, low academic performance, authority-defying risks and unsafe/illegal risks. Logistic regression estimated the relationship of characteristics to vegetarian status. The sample comprised 25 vegetarians (4%) and 605 omnivores. Analyses focussed mainly on females; 22 vegetarians and 315 omnivores. Dieting behaviours (current, frequent and past year), alcohol use, poorer social adjustment and poorer self-rated health were positively related to vegetarian eating ( $p < .05$ ). Among females (using logistic regression), past year dieting (OR 9.88; 95% CI 2.19–44.47) and alcohol use (OR 2.91; 95% CI 1.02–8.32) predominated in the presence of attitudes that personal health and animal rights are very important. The model predicted 79.9% of cases. Teenage vegetarians were distinctive in health behaviours. The independent, positive association of alcohol use with vegetarian eating is a unique and concerning finding. Dieting behaviours were strongly, independently and positively linked to female vegetarian eating. Further studies with a greater range of behaviours would be useful to more fully characterize teenage vegetarians and explore subgroups.

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### Introduction

Interest in vegetarianism has been increasing among adults and youth in Western cultures (American Dietetic Association and Dietitians of Canada, 2003) and the term ‘new’ or ‘new wave’ vegetarian has described those who switch to a vegetarian diet (Dwyer, Andrew, Berkey, Valadian, & Reed,

1983; Szabo, 1997) as opposed to being lifelong vegetarians. These diets are generally categorized by the foods they include. Vegans consume only fruits, vegetables, legumes, nuts, seeds and grains. Lacto- and ovo- vegetarians include milk products or eggs, respectively, but otherwise consume a plant-based diet. Lacto–ovo vegetarians include eggs and dairy products and avoid other animal products. Semi vegetarians include eggs and dairy products, some fish and/or poultry but avoid red meat.

Adult vegetarians tend to be health-oriented (Bedford & Barr, 2005; Kim, Schroeder, Houser, & Dwyer, 1999) and display lifestyle characteristics that are health-promoting. They are more likely to be leaner, be more physically active, smoke less, and consume less alcohol (Dwyer, 1988; Freeland-Graves, Greninger, Graves, & Young, 1986; Phillips, Hackett, Stratton, & Billington, 2004; White & Frank, 1994) though higher

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<sup>☆</sup> Note: This research was done while L. Greene-Finestone was a doctoral student at the University of Western Ontario, Canada and is unrelated to her present position.

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alcohol intake has been reported among adult male vegetarians in Germany (Burger, Mensink, Bergmann, & Pietrzik, 2003). In contrast, the majority of 'new' vegetarian teenagers adopt and maintain these diets for reasons other than health; weight reduction and personal philosophy – including ethical reasons and concern about the environment – are highly influential (Perry, McGuire, Neumark-Sztainer, & Story, 2001; Worsley & Skrzypiec, 1998). Unlike most adult vegetarians, similar (Larsson, Klock, Astrom, Haugejorden, & Johansson, 2002) or more health-compromising behaviours have been noted among vegetarian teenagers, the latter predominantly relating to extreme dieting behaviours such as frequent dieting, bingeing, purging and laxative use for weight control (Bas, Karabudak, & Kiziltan, 2005; Neumark-Sztainer, Story, Resnick, & Blum, 1997; Perry et al., 2001; Worsley & Skrzypiec, 1997). Among both adults and teenagers, period effects, regional differences, and philosophical, religious or attitudinal predispositions may have influenced findings.

There is evidence that weight control and health-compromising behaviours are inter-related among adolescents. In representative samples of teenage females (French, Boyle, Downes, Resnick, & Blum, 1995a; French, Perry, Leon, & Fulkerson, 1994) and teenage eating-disordered females (Crisp, Sedgewick, Halek, Joughin, & Humphrey, 1999), smoking has been used as a way to curb appetite and control weight. Among high school students, tobacco and/or alcohol use have been associated with unhealthy weight control behaviours such as frequent dieting, purging or lengthy dieting history (French, Boyle et al., 1995; French, Perry, Leon, & Fulkerson, 1995b; Neumark-Sztainer, Story, Dixon, & Murray, 1998; Wichstrom, 1995). Despite these relationships, significantly greater smoking and alcohol use have not been observed among adolescent vegetarians to date.

Among Canadian adolescents, approximately 1.0–2.4% of males and 3.3–8.8% of females are vegetarians or red meat avoiders (Beef Information Centre and Agriculture and Agri-Food Canada, 1998; Cohen, Evers, Manske, Bercovitz, & Edward, 2003; Greene-Finestone, Campbell, Evers, & Gutmanis, 2005). There is a lack of information on characteristics of Canadian vegetarians relative to their omnivore counterparts. The purpose of this study was to identify attitudes to health-related and social issues, health behaviours, social adjustment characteristics and self-reported health status related to these groups. Specific goals were to determine whether the recurrent finding of weight reduction behaviours in vegetarians in other countries held true in an Ontario, Canada sample and to determine which health behaviour and social adjustment characteristics were independently related to being vegetarian.

## Methods

The Opening Doors Student Self-Report Questionnaire (ODSSQ) was reviewed and approved by the Research Ethics Review Board of the Centre for Addiction and Mental Health, which is affiliated with the University of Toronto. This survey (DeWit et al., 1997), first implemented in 1993–1994, is the

screening tool for a school-based program aimed at reducing or preventing drug and deviant activity in at-risk youth.

The ODSSQ surveyed students in the Hamilton-Wentworth and Niagara regions of Ontario in 1999. All seven schools approached to participate, agreed to do so. The selection of schools was not random but within each school all Grade 9 students were invited to participate. Five public and two Catholic secondary schools from these regions were included. Private secondary schools were excluded. Community program consultants introduced the study to school administrative staff, teachers and students. The total number of students invited to take part was 1574. Parents received an information letter and indicated their agreement or refusal to have their child participate. The questionnaire took 40–60 min to complete. A face sheet was attached to each questionnaire with the student's name and a unique ID code (also appearing on the questionnaire). Face sheets were detached from questionnaires before collection.

Our study used responses to questions in the following areas: school behaviour and performance (10 questions), risk-taking behaviours (8), tobacco, alcohol and drug use (5), weight and height (2), dieting behaviour (2), vegetarian eating (2), self-reported health (1), and importance of selected issues (5).

Dietary status was assessed using self-reported consumption of red meats (2 questions), poultry (1), fish (1), eggs (1), milk products (3) protein or milk alternatives (4) from a 19-item food inventory based on items from the Health Behaviours of School-Aged Children Study (King, Boyce, & King, 1999a; King & Coles, 1992) and the School Health Project (Evers, Taylor, Manske, & Midgett, 2001). Categories of consumption ranged from "never or rarely" to "at least twice daily". For the purpose of this study, the vegetarians (VEG) included those identified as vegan, lacto-ovo, lacto, ovo and semi vegetarian, while those consuming red meat at least monthly were considered omnivores (OMN).

Sociodemographic and personal variables included sex, age and self-reported weight and height. BMI (weight (kg)/height (m<sup>2</sup>)) was calculated. Adiposity was estimated using age and sex specific BMI percentiles (Kuczmarski et al., 2000) with normal weight or less defined as BMI below the 85th percentile and risk of overweight or overweight corresponding to the 85th percentile or greater. In order to determine which attitudes might influence dietary status and health behaviours, respondents rated selected issues according to degree of importance to them. Responses were dichotomized to "very important" versus "somewhat important" or "not important".

Respondents indicated how often they had begun a weight loss diet in the past year; at least five times per year was classified as frequent dieting (Neumark-Sztainer et al., 1997).

The health risk behaviours assessed (5 questions) included use of cigarettes, alcohol and marijuana/hashish in the past 4 weeks. Use of sniffed glue or solvents, and LSD/PCP/cocaine/"crack"/"speed"/heroin were grouped together and categorized as illegal drugs (Adlaf, Ivis, & Smart, 1997).

A variety of social adjustment factors were assessed: risk behaviours, school misbehaviour and low academic performance. Higher scores indicate greater amounts of negative

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