Organic food and university students: a pilot study

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Abstract

Purpose – The purpose of this study is to provide information relating to organic food consumption patterns specific to the Canadian population and youth demographic. The primary objective of this pilot study is to investigate the knowledge, consumption patterns and willingness to pay for organic food among the first-year University students enrolled in courses at Brescia University College.

Design/methodology/approach – A questionnaire has been developed by the researchers and distributed to several first-year classes at Brescia University College. The results have been analyzed using Wilcoxon scores (rank sums), Wilcoxon two-sample test, Spearman correlation coefficients and univariate and multivariate regression analyses. A theme analysis has been generated from open-ended questions.

Findings – No significant differences exist between nutrition and non-nutrition students. Attitudes toward organic food and knowledge score significantly impact the consumption patterns and willingness to pay for organic food ($p < 0.0001$). Most students indicated that they were willing to pay a premium for organic food and had positive associations with it.

Originality/value – This is the first study relating to this topic and the Canadian population. Results from this study provide baseline data that may be used to conduct future research.

Keywords Organic food, market research, university students

Paper type Research paper

Background information

Organic agriculture has been referred as the most dynamic and rapidly growing sector of the global food industry, having evolved from a niche market to one with an enormous global demand (Agriculture and Agri-Food Canada, 2017). In fact, total annual sales of organic products in the Canadian market is estimated to be $3.5bn, with approximately 46 per cent of these sales being through large-scale retailers, such as supermarkets (Agriculture and Agri-Food Canada, 2017). This recent surge in popularity has been fuelled by consumer demand. As consumer knowledge has increased, they have become concerned with not only the nutrition but also the ethical and environmental implications of the food choices they make (Cerjack et al., 2010; Bravo et al., 2013). Overall, consumers tend to view organic food as healthier, more environment friendly and safer to consume than food produced through conventional agriculture (Cerjack et al., 2010; Brčić-Stipčević et al., 2013; Chinnici et al., 2002; Essoussi and Zahaf, 2008; Wang et al., 2010; Darnhofer et al., 2010).

Current research demonstrates that consumers have a low level of knowledge about the characteristics of organic food (Mesias et al., 2012; Campbell et al., 2014). Research also shows that consumers’ level of knowledge directly impacts their level of liking and
willingness to pay for organic food (Napolitano et al., 2010; Gil and Soler, 2006; Aertsens et al., 2011). For example, Napolitano et al. (2010) found that educating consumers about the practices of organic farming significantly increased their liking and willingness to pay a premium for organic beef.

There is disparity regarding the premiums consumers are willing to pay for organic products. For example, research undertaken by Janssen and Hamm (2011) in the European Union found that the willingness to pay a premium for organic products varied widely depending on both the country and the specific certification logo used. These results were corroborated by other studies regarding European consumers (Pourtashi, 2012; Corsi and Novelli, 2007; Zanoli et al., 2013; Mesias et al., 2012; Rodiger and Hamm, 2015).

Research examining consumer traits that correlate with consumption patterns and willingness to pay for organic food seems to be consistent across cultures. For example, research across a wide spectrum of different countries suggests that consumers with certain characteristics tend to be more likely to purchase organic food and be willing to pay a premium for it (Radman, 2005; Kesse-Guyot et al., 2013; Batte et al., 2007). Possessing a higher level of education is frequently cited as being typical of organic food consumers, including Canadian consumers (Canada Organic Trade Association, 2017; Curl et al., 2013; Kesse-Guyot et al., 2013; Wang et al., 2010; Tung et al., 2012).

In terms of a youth demographic, Nunez et al. (2014) found that formal education on the topic can affect a young person’s perception of organic agriculture. However, apart from this study, the literature specific to the knowledge, consumption patterns and willingness to pay for organic agriculture among the youth demographic is extremely limited.

Overall, the lack of consistency in evidence as well as research specific to this demographic of the Canadian population illustrates the importance of conducting further research on these topics.

Research methodology

Study design

This is a cross-sectional pilot study using students enrolled in the first-year courses at Brescia University College. This is a convenience sample, as the researchers share the same campus as the participants. Eligible classes were selected by identifying all first-year courses occurring in the Fall semester of the 2016/2017 school year at Brescia University College through the office of the Registrar at Brescia University College. The instructors for these courses were contacted through email and asked for permission to use their class time. Classes with very small enrollment levels (n < 20), classes with professors who declined or did not respond before November 29, 2015, were excluded.

The questionnaire was self-administered and participants remained anonymous to the researchers. Questionnaire administration took place during the first 10 minutes of class time and each student received a letter of information, a consent form and a questionnaire. Written consent was obtained by those who wished to participate in the study. The questionnaire was independent of the participants’ course work and the participants were given the choice whether they wished to participate in the study or not.

Approval from Western University’s Non-Medical Research Ethics Board was obtained prior to commencing this study.

Subjects

The inclusion criterion for this study is enrollment in the first-year courses at Brescia University College. The participants were recruited through the researcher contacting the course instructor and asking for using their class time to access the participants. In total,
four sections of the course FN 1030 (Fundamentals of Human Nutrition) and six sections of the course FN 1021 (Nutrition for Modern Living) were included in the study. From these class sections, 426 participants completed the questionnaire. This includes 165 participants from the FN 1030 sections and 261 participants from the FN 1021 sections. The students enrolled in the FN 1030 sections were those with nutrition as their specialization, whereas the students enrolled in FN 1021 represent numerous specializations, such as social science, business and engineering.

**Questionnaire design**

To assess the knowledge, consumption patterns and willingness to pay for organic food among university students, a standard questionnaire was developed by the researchers. The questions selected for inclusion on the questionnaire were gathered and adapted from existing literature that used questionnaires to evaluate the topics of interest in this study (Mesias *et al.*, 2012; Van Loo *et al.*, 2013).

The first section of the questionnaire gathered baseline data about the participants, such as their age, gender, field of study and financial status. The next section of the questionnaire focused on evaluating the participants’ level of knowledge and consumption patterns of organic food. The participants were not given a choice to say “I don’t know”, thus forcing respondents to answer the question based on their current knowledge (Van Loo *et al.*, 2013). The categories for responses to the questions regarding consumptions patterns were designed to be well defined and specific to avoid ambiguity and subjectivity associated with terms, such as “often” and “sometimes”. These categories were designed from referencing the Food Frequency Questionnaire used in the National Health and Nutrition Examination Survey study (National Cancer Institute, 2015).

Finally, to assess participants’ willingness to pay for organic food, the participants were asked how much of a premium they were willing to pay (if any at all) for organic food (as per existing literature on this topic). The participants were given the average price of a conventionally produced food product, and asked how much more they would be willing to pay for the same amount of the organic version of that product. They were given the choice of paying $0.5, $1.0, $1.5 or $2.5 more, as well as the option of indicating that they would purchase conventionally produced product (Mesias *et al.*, 2012; Van Loo *et al.*, 2013).

To provide greater context to answers given in this section, two five-point scales were developed. One addressed the importance of the price of a food product to the participant and the other addressed the importance of the manner in which a food was produced when they are deciding what food to purchase. For both of these scales, a score of 1 indicated “not important” and a score of 5 indicated “extremely important”.

To increase the validity and reliability of this questionnaire prior to use, it underwent several stages of pre-pilot testing using the test-retest method. It was revised after each stage in response to feedback received about the validity and ease of use. Initially, it was pre-pilot tested with one graduate students and one undergraduate student studying nutrition at Brescia University College. It was subsequently pre-pilot tested with three registered dietitians and three faculty members in nutrition at Brescia University College.

**Statistical analysis**

Frequencies and percentages were calculated to generate descriptive statistics. Wilcoxon scores (rank sums) and Wilcoxon two-sample tests were used to determine the associations between knowledge score and frequency of organic food consumption as well as attitudes toward organic food and frequency of consumption. These tests were also used to determine associations between attitudes regarding organic food and willingness to pay for organic
food. A logistic regressions analysis, including a univariate and multivariate analysis, was conducted to determine the correlations between student type (nutrition or non-nutrition) with consumption of organic food, as well as knowledge score and attitudes and consumption of organic food.

Results
Consumption patterns
Results from the survey show that 89.1 per cent of students surveyed indicated that they consume organic food, either sometimes or often, and 10.8 per cent responded “no” when asked whether they consume organic food.

Attitudes
Wilcoxon two-sample test results indicated that there is a strong correlation between various indicators of attitudes regarding organic food and both frequency of organic food consumption as well as willingness to pay for organic food. This finding was true for both nutrition and non-nutrition students. Specifically, participants’ views regarding the safety of organic food, the nutrition value of organic food, the perception that organic food is fresher and better in taste than conventionally produced food and the perception that organic food is better for animal welfare and the environment were significantly associated with the frequency of consumption and willingness to pay.

Multivariate analysis. Univariate and multivariate analyses illustrated a significant association between knowledge score ($p = 0.016$) and response to the attitude question regarding safety of organic food ($p = 0.0008$) and consumption of organic food.

Theme analysis of open-ended survey questions. Responses from the open-ended survey questions were grouped together on the basis of the overarching themes identified. This theme analysis demonstrated that baseline word associations, motivations and barriers are similar for both groups of students. Both groups most frequently associated the idea of organic food with variations of the term “health”. In addition, “expensive”, “no pesticides/chemicals/additives/preservatives”, “clean/safe/pure/natural” and “not genetically modified” were common associations for both groups. In terms of motivation to purchase and consume organic food, “to be healthy” was the primary motivation identified. Other motivations included avoidance of pesticides and chemicals and price/sales. Several students in both groups indicated that they do not purchase or consume organic food. Finally, two main barriers to purchasing and consuming organic food were identified by both nutrition and non-nutrition students. These barriers were the price of organic food and the lack of availability of organic food or access to it on university campuses and grocery stores.

Discussion
The theme analysis of the open-ended questions demonstrated that the majority of respondents associate organic food with variations of the term “healthy”. They also indicated that this is their primary motivation for consuming organic food. The perception that organic food is healthier than non-organic food is common across cultures and various geographic locations. For example, studies by Islam (2014), Bryla (2016) and Foster and Padel (2005) illustrated that consumers predominantly associate organic food with health and consume it for this reason. This pervasive attitude that organic food is synonymous with healthy food could be attributed in part to media and advertising by the organic food sector. Globally, the organic food sector campaigns that its products are produced in a “natural” manner that forgoes the use of synthetic chemicals (Thogersen et al., 2015). As a
result, consumers may seek to avoid these chemical toxins by purchasing organic food (Pino et al., 2012). To add to this, there has been considerable research published that demonstrates the adverse effects of pesticide exposure on human health (WHO, 2016; Kim et al., 2016). The drive to purchase food based on its perceived health benefits also mirrors an overall consumer trend toward health awareness (Bashir and May, 2015). In particular, the millennial generation, which represents the majority of the study participants, has been shown to be a strong driver of this trend (Pomarici and Vecchio, 2014; Hume, 2010).

Interestingly, although the majority of students surveyed indicated that they associated organic food with health, fewer expressed that they believed it was specifically more nutritious than conventionally produced food. Results from the statistical analysis illustrated the existence of a correlation between the question “organic food are safer than conventionally produced foods: agree or disagree” and willingness to pay for and consume organic food. This highlights the fact that although the vast majority of students associate organic food with variations of the term “healthy”, their view of healthy does not necessarily encompass nutrition. This implies that their perception of the health benefits of consuming organic food is based primarily on the belief that it is void of various chemicals and pesticides they believe to be detrimental to health and potentially unsafe, rather than any differences in nutrient value between organic and conventionally grown food.

Key barriers identified by both nutrition and non-nutrition students that prevent them from purchasing organic food include cost and accessibility. Given that 50 per cent of students surveyed indicated that they received some form of financial aid, it is not surprising that cost may be a prohibitive factor influencing their consumption of organic food. Organic food is often sold at a premium in comparison to conventionally produced food, which studies report may range from 47 to 303 per cent (Consumer Reports, 2015). This additional cost may make organic food unattainable for students who have a limited income. Furthermore, 52 per cent of students reported living on campus and having a university meal plan. In this situation, food choice is greatly limited. Meal plans are unlikely to offer organic food because of its increased cost. It is also less convenient for students to travel off-campus to grocery stores which may offer organic food. These barriers are mirrored in other studies examining food choices and consumption patterns of university students as well as the general population (Tam et al., 2017; Michels et al., 2008; Aertsens et al., 2011).

The results of this study suggest that the knowledge and willingness to pay for organic food are not significantly dependent on the field of study. This is consistent with Australian research which found that the eating behaviors among female nutrition and non-nutrition students did not vary significantly (Rocks et al., 2014). This may be due to the fact that neither group of students has received a significant amount of formal education on organic food characteristics given that most participants were in their first year of university. Therefore, the attitudes and knowledge captured in this research study are likely shaped by factors that are common to both groups, such as public media (television and radio), social media (various internet applications including Facebook and Twitter) and physical advertising (billboards and flyers). With an increasing amount of formal education on the characteristics of organic food, there may be a more pronounced difference between the two groups of students. This is demonstrated in other studies where willingness to pay for organic food is measured before and after receiving education about the characteristics of organic food. In some studies, consumers were more likely to purchase organic food after receiving education regarding the attributes of organic food (Napolitano et al., 2010).

Similarly, univariable logistic regression analysis yielded a $p$-value of 0.3475 with an odds ratio of 0.732 and with a 95 per cent confidence interval of 0.382-1.403 for the independent variable of student type (nutrition student versus students pursuing other
fields of study). Because this value is less than 1, this indicates that non-nutrition students are less likely than nutrition students to consume organic food, but not significantly so. These results are not surprising, as it was hypothesized that those with a strong interest in nutrition would be more interested in organic food. However, the lack of a significant difference between the two groups of students may be because of the lack of formal education, similar influences shaping perceptions of organic food (media, advertising), as well as shared barriers (accessibility and cost).

Attitudes appear to exert a more substantial influence on consumption patterns and willingness to pay for organic food. Regardless of the field of study, participants who responded positively to questions measuring attitude toward organic food were significantly more likely to consume organic food and be willing to pay a premium for it. For instance, response to the question regarding the perceived safety of organic food was highly correlated with both dependent variables. Similarly, responses to other attitude questions regarding environmental friendliness, animal welfare and sensory properties of organic food yielded similar results. This is a logical association, as it would be unlikely for someone to have negative perceptions of organic food to have the desire to pay a premium for it and consume it frequently. This is similar to a study by Aertsens et al. (2009). They examined the personal determinants of organic food consumption and found that attitude toward organic food was a significant contributing factor. The importance of attitude in organic food consumption is highlighted in additional research on this topic (Aertsens et al., 2011).

In addition, multivariable logistic regression analysis illustrated that knowledge score and response for the attitude-based question regarding the perceived safety of organic food are independently associated with consumption patterns of organic food. Within the logistic regression analysis model, these two factors adjust for one another. For example, the effect of the knowledge score is significant when adjusting for the attitude-based question and vice versa. Other factors may be significant in the univariable analysis but once these two factors are in the model, the others do not contribute significantly. This is consistent with other studies conducted on different populations globally, which have illustrated a correlation between product characteristic knowledge and willingness to pay for organic food and consume it (Napolitano et al., 2010). Other studies have also highlighted a correlation between positive attitudes, such as the perception that organic food is safer, and consumption patterns (Gil and Soler, 2006).

Another interesting finding is that a large proportion of students, both nutrition and non-nutrition, is willing to pay some form of premium for organic food. For example, 75 per cent of students indicated that they would be willing to pay a premium of $0.5-$2.5 for organic yogurt and 79 per cent indicated that they would be willing to pay the same premium for organic tomatoes. This contradicts the popular stereotype of the “starving university student”, whereby they would be unwilling to pay any form of a premium for organic food because of the cost being prohibitively high. Despite the fact that 50 per cent of students surveyed reported receiving some forms of financial aid, the millennial population place a high priority on what they perceive to be in line with their values and beneficial to their health. For instance, other research has highlighted that millennial population is more likely to consider the aspects such as social justice, environmental protection and similar issues when making purchases (Bucic et al., 2012).

Limitations
There were some limitations to this study. These include the use of a questionnaire that has not been validated and potential self-selection bias.
The questionnaire used for this study was created by the researchers. Existing questionnaires from similar research were used as models to guide the formulation of questionnaire content. It should be noted that this is a new and emerging area of research. Consequently, there are no existing, validated questionnaires that measure the dependent variables examined in this study within the university student population. Therefore, the results from this research study are not generalizable beyond the study population at the University of Western Ontario. However, the questionnaire underwent several rounds of pre-pilot testing to increase its validity. Furthermore, because of the novel nature of this research, the use of a questionnaire that has not been validated is acceptable, as it may serve as a template to produce a validated questionnaire for future research.

Another potential limitation for this study is the possibility of self-selection bias by participants. Students who are already interested in the topic of organic food may have been more likely to consent to participate in a research study regarding organic food. Therefore, the results of this study may be skewed in a favorable manner. However, the response rate of this survey was high: out of 550 potential participants, 426 (165 nutrition students and 261 students from other faculties), consented to participate, which is a 77.5 per cent response rate. Given this relatively high response rate, it is likely that a greater variety of students, including those who do not have a particular interest in organic food, were captured in this study.

**Strengths**

One of the key strengths of this study is that the participants were representative of the general university student population. In addition to nutrition students, the study group was comprised of non-nutrition students encompassing a wide range of university disciplines and therefore presented no academic bias toward organic food. Therefore, it provided a comparison of the dependent variables measured to the nutrition student group, who, by virtue of being enrolled in a nutrition program, are assumed to have a greater understanding of the characteristics of organic food.

In addition, the response rate of this survey was high. Students in several first-year classes at Brescia University College were asked to participate in the survey. Of the 550 potential participants, 426 completed the survey, which is a 77.5 per cent response rate.

**Conclusions**

The results of this research indicate that both nutrition and non-nutrition students view organic food as “healthy” and that this is their primary motivation for consuming it. Both groups of students expressed similar barriers that prohibited them from consuming organic food. The lack of significant differences exhibited between the two groups may be attributed to a lack of formal education on organic food characteristics. With an increasing amount of formal education on the topic of nutrition, there may be a more marked difference observed between nutrition and non-nutrition students. The results of this research suggest that nutrition students are more likely to purchase organic food, but not significantly so. Of all the variables measured, knowledge score as well as attitudes toward organic food independently influence consumption patterns among both groups of students. This research provides baseline data with which to structure future studies. Because most of the participants in both groups of students were at the beginning of their post-secondary academic careers, neither had significant formal education on the topic of organic food. Therefore, any data that is collected on university students in future research studies may be compared to this to gauge the influence of formal education on the dependent variables. Existing literature suggests that the level of formal education is a predictor of knowledge,
consumption patterns and willingness to pay for organic food. As a result, it is recommended that this study should be continued and the questionnaire be redistributed to the same students in their third and fourth years of university. It is likely that the influence of formal education will be illustrated this way.

References


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