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## **The potential impact of the Health Check™ on diet quality of food away from home purchases**

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## Abstract

Consumption of food away from home (FAFH) is widely believed to be a contributing factor to the current obesity crisis and other diet related problems in North America. Although FAFH expenditure represents a lower proportion of food expenditure in Canada than in the United States (24% versus 50%) it is still a significant part of Canadian diets. The Canadian Heart and Stroke Foundation has developed a third party accreditation program to identify healthy food items in grocery stores and more recently, restaurants, called the Health Check™ program. The program is not without controversy since some people feel that it is inappropriate to pay for the use of the label and it may be misleading that many processors and restaurants choose not to apply for their food products resulting, in some cases, that healthier foods without such a label may be next to other products with labels on shelves or on menus. For such a diet indicator to be helpful in enhancing public health the label must be used by people who have health problems and buy the food products labeled.

The objective of this research is to examine the possible impact of the Health Check™ program for a particular group of Canadian FAFH consumers. Through the use of the NPD Group CREST® data over the period February 2007 to February 2009, actual restaurant purchases for a representative panel of Canadians were identified. In August 2009 a survey of 3319 of those same panelists was conducted. As part of the survey, respondents were asked for stated preferences for a turkey sandwich with various different nutrition labels and the Health Check™. The results suggest that there is on average a positive WTP for the provision of additional nutritional information associated with turkey sandwiches and for the Health Check™. The results highlight the importance of providing fat content information, in terms of attracting the attention of the survey respondents to the nutrient content. There is little link between survey respondents level of historical diet quality and their willingness to pay for the Health Check™ information in their sandwich purchases; unfortunately this suggests that the Health Check™ might not have its biggest impact on those that need it the most. For those with the highest historical diet quality the provision of nutrient information and/or the Health Check™ has little appeal, perhaps reflecting their higher existing nutritional engagement – do they actually need more information?

## **The potential impact of the Health Check™ on diet quality of food away from home purchases**

Public health issues related to obesity, chronic disease have led to interest in the determinants of food choices, both for food consumed at home and for food consumed away from home (FAFH). The FAFH market has been the object of many policy recommendations including mandatory nutritional labelling (calorie specifically) and nutrient regulation (sodium and trans fats). In the United States mandatory calorie disclosure for chain restaurants came into federal law in 2010. However the possible efficacy of such policy recommendations to improve public health depends critically upon the decision making processes of FAFH consumers as well as the importance of FAFH consumption in the individual's total food consumption.

Based on the Survey of Household Spending (Statistics Canada 2011) average Canadian annual household spending on food service increased from \$1152 in 1997 to \$1715 in 2007 and decreased to \$1577 in 2009, while the FAFH share of the household food dollar increased from 20.5% to 23.5% in 2007 (21% in 2009) over the same period. With data as at 2010, the Canadian Restaurant and Food Association (CFRA) reported that the average Canadian household sourced one in ten meals from restaurants. From a 2010 survey, the CFRA reported that only 1 in 15 Canadians reported restaurant purchases as a daily occurrence. From the same survey 62.5% of Canadians regard restaurant purchases as a luxury and only 15% regard restaurant purchases as a part of everyday life. In general, these numbers highlight the fact that Canadian restaurant participation is lower on a per capita basis than equivalent participation in countries such as the United States.

The Canadian government has chosen not to mandate the provision of nutrition information at restaurants or specifically at chain restaurants. The CFRA has encouraged the provision of nutrition information to Canadian consumers through voluntary guidelines directed at "chains that have a uniform menu concept with consistent menu items and portion controls throughout their systems". "Nutrient values will be as consistent as possible with the core nutrition label information required for packaged goods and will include calories, fat, cholesterol, sodium, carbohydrates (fibre, sugar), protein, vitamin A, vitamin C, iron and calcium".

(<http://www.cfra.ca/research/resources/foodandfitnessfacts/voluntaryguidelines.asp>, accessed May 27, 2009). Although the CFRA website only identifies participation in the voluntary nutritional labelling program of thirty three restaurant chains within Canada, the authors were able to identify nutritional information for over 80 restaurant chains in Canada from print or web based materials. However even this access to nutritional information has not reduced the controversies around nutritional labelling in restaurants in Canada. The Center for Science in the Public Interest (2012) recently released a report highlighting their concerns about the lack of mandatory nutritional labelling in restaurants, related to inaccessibility of voluntary labelling, lack of quality control in nutritional information in voluntary programs among other things. The provinces of Ontario and British Columbia have considered mandating nutritional information at chain restaurants but have yet to enact legislation. In related programs, the Canadian Heart and Stroke Foundation has developed a third party accreditation program to identify healthy food items in grocery stores and since 2006, restaurants, called the Health Check™ program. The program operates with the application, for certification, from a processor or restaurant, to the Heart and Stroke Foundation. The food product is considered and if it meets the criteria as

established, is approved, allowing the label to be added to packages or menus. The successful applicant pays a fee to the Heart and Stroke Foundation. The program is not without controversy since some people feel that it is inappropriate to pay for the use of the label and it may be misleading that many processors and restaurants choose not to apply for their food products resulting, in some cases, that healthier foods without such a label may be next to other products with Health Check™ labels on shelves or on menus (von Tigerstrom, 2009). As of April 2011, the Health Check™ website reported that there were Health Check™ items in over 1500 restaurant outlets across the country.

However it is still possible that the public is purchasing food through restaurants without necessarily being aware of the availability of a diet quality indicator such as the Health Check™ symbol. For such a diet indicator to be helpful in enhancing public health the label must be used by people who have health problems and buy the food products labeled. The program could also reinforce healthy choices for those without health problems. The expansion of the program since 2006 suggests that restaurants view the program as an important addition to their menu information. However there is little empirical research on the effectiveness of the program in terms of affecting restaurant choice or improving diet quality, in the FAFH market in Canada.

The objective of this research is to examine the possible impact of the Health Check™ program for a particular group of Canadian FAFH consumers. Through the use of the NPD CREST data over the period February 2007 to February 2009, actual restaurant purchases for a representative panel of Canadians were identified. In August 2009, a survey of 3319 of those same panelists was conducted. As part of the survey, respondents were asked for stated preferences for a turkey sandwich with various different nutrition labels and the Health Check™. Based on the hypothetical choices of this particular menu item available to Canadian consumers and their actual purchase history it is possible to examine whether the consumers with the lowest diet quality are, in fact, willing to choose products labeled with the Health Check™ and potentially improve their FAFH choices. Examining the actual diet quality of the individuals who are willing to pay for the Health Check™ symbol will suggest whether the program can have a large impact on public health. The unique ability to examine both the hypothetical and actual purchase history information can provide meaningful data on the potential public health outcomes of the program.

## Previous Literature

A few studies have borne out the link between obesity and food away from home choices by particular groups. For example, Taveras et al (2005) showed a link between weight gain and FAFH purchases in older children and adolescents. Ayala et al (2008) showed a link between weekly restaurant purchases and children's food intake and children and adult weight and also showed similar linkages for weekly dining at the homes of relatives, neighbours and friends. Jeffrey et al (2006) showed a link between restaurant consumption, high fat diets and BMI. Bes-Rastrollo et al (2009) showed statistically significant linkages between FAFH consumption and a higher risk of becoming overweight/obese in a Spanish

population. If the existence of a link between restaurant purchases and health is not in dispute then the question switches to whether or not interventions can ameliorate the negative health impacts.

The study of nutrition labelling in restaurants is extensive, focused mainly on the United States. Researchers such as Sullivan et al (1995) and Lando and Wolfe (2007) have shown that nutrition labelling in restaurants, including fast food restaurants, is of interest to consumers and can improve nutrition outcomes. Lando and Wolfe also identified that many consumers may focus on a limited set or just one nutrient ('I try to keep my sugar down') when using nutritional information to make choices. O'Dougherty et al, (2006) found that consumers would be interested in higher levels of nutritional information provided through restaurants – particularly fast food restaurants. Roberto et al (2009) found that very few consumers (6%) actually appeared to consider nutritional information either before or after food purchases in a number of major fast food chains, through observation. However, it is possible that once consumers have considered nutrition information at a particular restaurant they may not closely examine the information in future visits to particular restaurants – even though nutritional information could vary across time. It is interesting to note that an early British study (Aaron et al, 1995) found that the provision of nutritional information in a student cafeteria had the 'paradoxical' effect of decreased nutritional quality choices by some members of the study. There seemed to be little consideration of the additional nutritional information provided in the second week of the trial – the nutritional information provided focused on fat content. This was in spite of the fact that over 60% of study participants suggested that they would consider nutritional information in making food selections. Bates et al (2009, pg 271) highlighted the fact that 'nutrition disclosure efforts may be most effective when combined with education campaigns aimed at increasing consumer levels of motivation and nutrition literacy' in their study on the effects of nutrient information on food away from home purchase intentions. In experiments with university students, Drichoutis et al (2009) found that subjects were willing to pay more for menu items with nutritional information than for those without such information. They also tested different types of information (EU nutritional labels, US nutritional labels and a traffic light symbol) and found that, in general, preferences were for EU nutritional labels or the traffic light symbol rather than the US type label.

In a study after the implementation mandatory calorie disclosure rules in New York city, comparisons of purchases at Starbuck in NYC with those in Boston and Philadelphia (no calorie disclosure) highlighted lower calorie intake (through food but not beverage purchases) in the restaurants with calorie disclosure (Bollinger et al, 2009).

The literature suggests the potential for positive impacts of various different types of nutritional information on consumer FAFH choices, in terms of health, particularly calorie information. However a number of questions about the impact of the information on choices for particular individuals remain open. For example are the people most likely to benefit from diet changes likely to be affected more or less by nutritional information and/or the provision of third party accreditation such as a Health Check™?

## Methods

In Canada and other countries the NPD Group tracks individual restaurant purchases through their 'Consumer Reports on Eating Share Trends' (CREST®) panel, offering insight on consumer purchases of commercially-prepared meals and snacks. It tracks purchases in the commercial restaurant industry, as well as ready-to-eat foods/beverages purchased from other retail establishments such as convenience and food stores.' (<https://www.npd.com/>). This database tracks restaurant purchases by item, restaurant outlet, meal type and characteristics of the purchase occasion. Demographic details on the panel members are also maintained. Normally panel members track restaurant purchases for a two week period in every quarter of a year. The data provide a snapshot of an individual's restaurant purchases in a particular quarter and purchases for an individual can be tracked across time, as long as they continue to participate in the panel. Changes in the NPD Group data collection processes produce a data set for individuals starting in February 2007. For this study data over the period February 2007 to February 2009 is used as the basis of analysis of actual restaurant purchases. For these purchases, expenditure in fast food/chain restaurants and other restaurants are collected. In addition the actual restaurant purchases by item are used to establish measures of diet quality in FAFH for each individual.

Assessment of diet quality is possible by using an overall diet quality index based on nutrients. For nutrients at risk of excess supply (e.g. saturated fatty acids) the actual intake is compared to the recommended levels and lower levels indicate a higher diet quality. For nutrients at risk of deficient intake (e.g. folate acid), the actual intake is also compared to the recommended intake and higher intake indicates higher diet quality. The indicators are given in percentages and can be combined into an overall value (Thiele, Mensink and Beitz, 2004). Actual nutrient intake is available by nutrient composition information for various FAFH products that have been collected by the authors from the restaurants. They are combined with the information about purchases of FAFH product quantities from the CREST® database.

In most cases the historical purchases made by the CREST® panel members were made in restaurants that did not participate in the Health Check™ program. Thus it is difficult to use the actual historical data to evaluate the impact of the Health Check™ program. In order to examine the potential impact of the Health Check™, a survey of members of the CREST panel was conducted, incorporating stated choice (SC) experiments. Hypothetical stated choice (SC) experiments can be used to investigate consumer preferences for new or unavailable products, and to investigate differences in preferences across socioeconomic characteristics of choosers. One drawback of SC experiments is the lack of economic consequences to the choices made by respondents (ie. they do not have to actually purchase the products). Given the internet based approach required by use of this market research panel, there was no option other than stated choices to develop preferences for a restaurant menu item with different attributes.

The survey's stated choice section contains a number of choices where individuals choose between different types of turkey sandwich (varying by bread and toppings) which contain different levels of

nutrients at a variety of prices. A turkey sandwich was selected because of the possibility of the menu item satisfying the Health Check™ criteria. From an examination of the nutrient content of many other common individual menu items (using nutrition information collected by the authors) many items would not satisfy the Health Check™ criteria with respect to sodium or fat content. The actual Health Check™ criteria are presented in Table 1.

Insert Table 1 here

Although the focus of this research is on the effectiveness of the Health Check™, previous research highlighting the importance of context to the effectiveness of the provision of nutrition information suggests the need to identify nutrient content of the sandwich as well as the Health Check™. The voluntary agreement developed by the CFRA suggests the need for restaurants to provide the list of fourteen nutrients required by the mandatory nutrition facts for processed foods. This list of 14 nutrients is a combination of ‘good’ nutrients, such as certain vitamins and calcium and ‘bad’ nutrients such as fats and sodium. The actual information required on the Canadian nutrition facts panel for processed foods is provided in Figure 1.

Insert Figure 1 here

To examine the impact of both good and bad nutrients (although given the structure of the nutrition facts panel it is less likely that consumers will focus on good nutrients) and to avoid information overload, the nutrients identified for use in the SC experiments are vitamin A and C, fat and sodium. To test how consumers use available information in making choices, half of the sample will see only sodium, Vitamin A and C content (Health Check™ assigned to qualifying sandwiches) as well as price of the turkey sandwiches that they choose between (or neither) while the other half of the sample will see exactly the same sandwiches although they will see nutritional information that also includes fat content. This may provide some useful information on whether consumers see the vitamin content as important as some of the ‘bad’ nutrients (such as fat and sodium). The vitamin, fat and sodium content of various sandwiches are developed using a sandwich nutrient calculator for different choices. To minimize the complexity everything stays the same in the sandwich with the exception of the bread (huge impact on sodium, fat content) and the dressing (impact on vitamin content). The sandwiches are sold at three different prices. The attribute levels are provided in Table 2.

Insert Table 2 here

The experimental design for the sandwich choices (A, B or neither) is a fractional factorial design (designed using SAS<sup>1</sup>) of 36 combinations (out of a Full Factorial design of 326 combinations) with each respondent completing 12 out of 36 choice combinations. An example choice set is provided in Figure 2.

Insert Figure 2 here

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<sup>1</sup> This analysis was generated using SAS™ software Version 9.2 for Microsoft Windows © 2010 SAS Institute Inc. SAS and all other SAS Institute Inc. product or service names are registered trademarks or trademarks of SAS Institute Inc., Cary, NC, USA.



Half of the survey respondents make choices between two turkey sandwiches with differing levels of sodium and vitamins A and C (or neither sandwich) while the other half of the respondents make choices between two turkey sandwiches with differing levels of fat, sodium and vitamins A and C (or neither sandwich). An additional attribute of the turkey sandwiches is that some were identified as satisfying the Heart and Stroke Foundation Health Check™ standards (in effect in September 2009).

In this research multinomial logit regressions are used to explain the probability that consumers will select sandwiches with identified attributes. From these regressions the consumer willingness to pay for each of the attributes can be identified – in this study the consumer willingness to pay for a higher vitamin (fat, sodium) content in a turkey sandwich as compared to a sandwich with lower vitamin (fat, sodium) content and the consumer willingness to pay for a turkey sandwich with the Health Check logo as compared to a sandwich without the logo can all be identified. These regressions are based on a random utility framework which assumes that each individual respondent maximizes utility associated with choices made between the three alternatives, in this study. Each respondent makes a number of choices (12 in this case) resulting in a set of panel (3319 respondents each with 12 choices) observations. From Enneking (2004), the respondent's utility function can be defined as:

$$U_{in} = (V_{in} + \epsilon_{in}),$$

where  $U_{in}$  is the overall utility of choice  $i$  for respondent  $n$ ,  $V_{in}$  represents the systematic or measurable utility, composed of  $\beta_i * X_{in}$  and  $\epsilon_{in}$  represents the random utility component.  $X_{in}$  represents characteristics of choice, characteristics of respondent and possible interactions between the two characteristics, while  $\beta_{in}$  represents the parameters to be estimated. If  $A$  represents the complete choice set available to a respondent and  $J$  represents the number of elements in  $A$ , the probability that a respondent will choose  $i$  from set  $j$  can be written as:

$$P_{in} = \{ \{\epsilon_{jn} - \epsilon_{in}\} < \{V_{in} - V_{jn}\} \}, \text{ for all } j \neq i.$$

To estimate the choice probabilities above, following McFadden (1974), the assumption of an independent and identically distributed type I extreme value distribution leads to a conditional logit model of the following form:

$$P_{in} = \exp(V_{in}) / \sum_i^j \exp(V_{jn}), \quad j=1...J, \quad j \neq 1.$$

The mean willingness to pay for different interventions can be calculated for the actual nutrient content of each sandwich and the Health Check™. Following Loureiro and Hine (2005) "the respective WTP estimates were calculated as Hanemann (1989) proposed such that:

$$E(WTP) = 1/\beta (\ln (1 + \exp \gamma)),$$

where  $\gamma$  denotes the grand constant, which is the sum of the products of the estimated coefficients (except the one corresponding to the price/premium) times the mean values of their corresponding explanatory variables and  $\beta$  denotes the parameter on the price/premium" (page 475).

The willingness to pay (WTP) can be calculated for each survey respondent using actual values of explanatory variables (characteristics of the chooser) used in the regressions. Once calculated the actual respondent willingness to pay for higher vitamin content, lower sodium/fat content and for the Health Check™ can be compared to the individual respondents' actual historical diet quality. For an intervention such as the Health Check™ to have its maximum impact on public health, it would be beneficial for the panel members with lower diet quality in FAFH purchases to respond the most to interventions such as the Health Check™, assuming all else equal. Whether this appears to be the case or not can be established for this sample of the Canadian population.

## Data Description

The survey, containing stated choice questions, was completed by 3319 Canadians, in August 2009. The survey respondents were all members of the NPD Group CREST® panel although some had not been with the panel long enough to have historical purchases over the period February 2007 to February 2009. In addition to the stated choice experiments the survey respondents answered a number of other questions related to demographic characteristics, personality traits (eg. worry) and health status. The data for the survey respondents divided into the two samples that will be analyzed separately are presented in Table 3. Beyond normal demographic and regional characteristics, an estimate of the individual's tendency to worry in general (derived from three statements out of the Penn State Worry Questionnaire, <https://www.outcometracker.org/library/PSWQ.pdf>) is used to characterize the individual respondents. The hypothesis in including this variable in later regression models is that people who worry more may pay higher attention to their diet and/or to the information provided in the hypothetical choices that they make. The responses suggest a relatively low level of worry present in the individuals surveyed (the range of responses is between 3 and 21). In addition, given the characteristics of the choices being made by respondents, some assessment of the individual's health status (self reported) might be useful. In this case the respondent's were asked to assess their current health status and to assess changes in their health status over the past year. The latter question is used in later regression models to test whether decreases in perceived health status affect the individual's interest in healthier restaurant choices and/or information associated with those choices. Although many analysts are not impressed by the availability of nutritional information available in Canadian restaurants, in some restaurants it is provided whether you ask for it or not, on the underside of a tray liner, for example, at MacDonald's restaurants when individuals choose to eat in the restaurant. Given that the nature of this research is about the provision of nutritional information and health signals, we thought the possibility that individual's were aware or had ever asked for nutritional information in restaurants previously might be a useful categorization. Approximately 25% of both samples were aware of the provision of nutritional information in restaurants prior to the survey.

Insert Table 3 here

## Estimation Results

The regression outputs from the two logit models (regression results for the sample that did not include fat as an attribute and results for the sample that did include fat as an attribute) are discussed below and presented in Table 4.

Insert Table 4 here

In the first regression (NO FAT), of 18701 choices) 4471 choices (24%) were the neither option. From Table 4 it can be seen that 22 out of 59 parameters are statistically significant at the 10% level (or better). Of the variables that are significant, *price (pr)* has the expected negative sign. The first thing of note is that the probability of selecting sandwiches with higher vitamins (A and C vary together) or with a Health Check™ are positive (although only the *Health Check™* is statistically significant at the 1% level). The probability of selecting sandwiches at higher sodium levels is negative and statistically significant at the 1% level. The other explanatory variables are all interacted with the sodium, high vitamin or Health Check™ attributes. The interactive variables highlight adjustments to the respondent's probability of choosing a sandwich with the specific attributes. Focusing on the Health Check™ interactions, being from a family with children and having a general tendency to worry, increase the probability of selecting a turkey sandwich with the Health Check™, being a non-meat eater reduces the probability of selecting a turkey sandwich with the Health Check™.

In the second regression (WITH FAT), of 18957 choices, 4643 choices (24%) were the neither option. 31 out of 59 parameters in the equation are statistically significant at the 10% level (or better). The probability of selecting a turkey sandwich with higher vitamin content, with a Health Check™ are both statistically significantly positive while the probability of selecting a turkey sandwich with higher fat (and sodium content since the levels are correlated) is significantly negative. Focusing on the Health Check™ interactions, the probability of selecting a turkey sandwich with a Health Check™ symbol is higher at higher income levels, is higher if the respondent has asked for/received nutrition information in restaurants previously, is higher if the respondent is female or if the respondent has a general tendency to worry and is lower if the respondent is a vegetarian, is negative if the respondent is from a family with children and is negatively related to health status being much worse this year than last year.

The calculated willingness to pay for the various attributes with a turkey sandwich are portrayed in Table 5. They suggest that, on average across the samples, WTP for higher vitamin content is positive and represents between 12 and 20% of a basic turkey sandwich price. Although the WTP for additional sodium is negative in the first analysis (where fat content was not provided) it is practically insignificant; the information on fat content in the second sample results in a negative WTP that represents over 50% of the base turkey sandwich price. With respect to the addition of a Health Check™ symbol, the estimates of WTP do not vary much between the two samples and represent approximately 10% of the base turkey sandwich price. These results do not suggest that everyone is willing to pay additional amounts for the various attributes and, in Figures 3 and 4 the distribution of the WTP for the two positive health attributes, the Health Check™ and the higher vitamin content are each shown. Although understood from the different mean values reported earlier it becomes clearer that the distributions for

the WTP for higher vitamin content are different in the two samples while those for the Health Check™ are almost the same in the two specifications.

The central question of this research is whether an intervention such as the Health Check™ program can enhance public health. Although there would likely be a benefit for all citizens from better diet choices, the biggest public health pay-off is likely associated with people currently having the lowest diet quality willing to pay the highest values for the Health Check™, in essence signalling their willingness to allow the Health Check™ to highlight better dietary choices. In this unique data set there is actual FAFH purchase history for the majority of the survey respondents. From their actual purchases an overall diet quality indicator is established for each respondent (based on their purchases over the previous two year period). Arbitrarily the survey respondents are divided into three groups – those with low, medium and high diet quality. For each group the average WTP for higher vitamin content, higher sodium/fat content and the average WTP for the Health Check™ are calculated and presented in Tables 6 and 7. From the mean data, it is clear that people in the lowest diet quality category are WTP the most for higher vitamin content (and the least for higher fat content), in the sample that was exposed to the fat content of the sandwiches. For the Health Check™, in both samples people in the middle diet quality category have the highest WTP, although the differences across groups are quite small. It is perhaps sensible that the smallest average WTP for the Health Check™ symbol are associated with respondents in the highest FAFH diet quality category, perhaps those individuals have sufficient nutrition awareness that they see little need for further reinforcement of diet quality.

Insert Tables 6 and 7 here

In examining the correlation coefficients between the diet quality levels and the WTP for each attribute within each category, the most consistent correlations are found for the higher vitamin WTP. There is a statistically significant negative relationship between WTP for higher vitamin content and diet quality levels in the high diet quality category (reflecting again perhaps the different level of nutritional awareness in the higher diet quality group) but a positive correlation between diet quality and WTP for higher vitamins (no fat group with medium diet quality and low diet quality for the with fat group). There are no statistically significant correlations with WTP for the Health Check™ and diet quality in any of the three groups for either sample.

## Summary

Although there is significant policy debate in many countries about the necessity to mandate nutritional information in FAFH environments, there are many questions about the possible effectiveness of such programs. In this research an examination of whether either nutritional information or a third party nutritional certification could encourage healthier diet choices was conducted. For any intervention to enhance public health the intervention has to be effective, in that people respond to it and that they respond enough to actually improve public health.

The results from the hypothetical stated choices presented in this analysis confirm some of the findings from the previous literature. There is clearly a positive influence on stated choices of the provision of nutritional information and of the provision of a third party certification. Although the third party

certification program, in this case the Health Check™ symbol has a positive influence on stated choices positive, the effect is relatively small and does not seem to be affected by the provision of other nutrient information. The provision of fat information does seem to have the biggest influence on stated choices in this research, it also has an influence on the value of other nutrient information provided, in this case the vitamin A and C content of the sandwiches. In the context of fat information being provided as well as vitamin content, the WTP for higher vitamin content rises dramatically. The provision of sodium information in the absence of fat information has an almost insignificant impact on the value of a turkey sandwich although the effect is statistically significant.

An attempt was made in this paper to examine whether the people who stand to benefit the most ( in terms of enhanced health) would actually be the ones to value a signal such as the Health Check™ the most and likely act on its signal. Examining the actual FAFH diet quality of these individuals prior to completing the survey and stated choices and linking it to their individually calculated WTP for the Health Check™ does not provide a clear signal. It appears that the individuals with medium diet quality are willing to pay more for the Health Check™ than those with lower or higher diet quality. While it is conceivable that those with the highest previous diet quality had less need for the Health Check™, it is worrying that those with the lowest diet quality do not have more interest.

In this research the effectiveness of a third party certification scheme was not addressed specifically. The issues related to how the program is run, the lack of standardization across all restaurant menu items (the fact that restaurants may choose not to enter the program and have no nutrition signalling or another system) and the potential confusion such issues raise have to be considered when examining the efficacy of such third party programs. The results of this research suggest the potential for these programs to affect purchase decisions but if the signals are not widely available through the majority of restaurants (who must pay fees for nutritional evaluation of their products and annual use of the logo) their impact on public health must be limited. In spite of the fact that the analysis in this research was targeted on a particular food item, a turkey sandwich, the results are statistically robust. Further research across a range of other eligible products is necessary to establish whether the results are independent of the food product chosen.

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Table 1: Health Check™ Menu Requirements, Fall 2008  
(requirements changed in December 2009)

Small Entrees (250-349 gms)

Menu items must fit

the criteria per 250 gm serving

and per menu serving

Option #1

Fat 10 gms or less

Protein 10 gms or more

Sodium 960 mgs. or less

Option #2

Saturated fat 2 gms. or less saturated and trans fat  
combined per 100 gms

Fat 15 gms or less

Protein 10 gms or more

Sodium 960 mgs or less

Option #3 fatty fish meals

Fat 10 gms or less (except fat naturally occurring)

Protein 10 gms or more

Sodium 960 mgs or less



Table 2: Attribute Levels for Turkey Sandwiches

Sandwich Attribute	Fat Content	Sodium Content	Vitamin A content	Vitamin C content	Health Check™	Price
Bread 1: Dressing 1	4.81 gm	579.81 mg	low	low	eligible	\$4.50
Bread 2: Dressing 1	5.36 gm	908 mg	low	low	ineligible	\$5.00
Bread 1: Dressing 2	4.9 gm	544.69 mg	high	high	eligible	\$5.50
Bread 2: Dressing 2	5.45 gm	872.88 mg	high	high	ineligible	

Table 3: Sample Characteristics for Analysis

<i>Variable</i>	<i>Canada – without fat</i>	<i>Canada – with fat</i>
Sample Size (total)	1649	1669
Number of Choices	18701	18957
% of choices the neither option	24	24
	% response	
Gender - female	48	47
Children under 18 in household - yes	26	22
City versus town or rural	64	66
British Columbia	14	15
Alberta	10	9
Manitoba	5	4
Ontario	35	36
Quebec	23	24
Maritimes	7	5
Asked for or received nutritional information in a restaurant - yes	25	25
Eat fish but not meat	1.6	1.8
Vegetarian	1	1.6
	Mean (Standard Deviation)	
Age -years	50.34 (13.75)	50.62 (14.08)
Household Income (all in thousand dollars Canadian)	77 (41.77)	75 (41.44)
Worry (three statements with scales 1 = not at all to 5 = very typical)	7.29 (3.45)	7.18 (3.34)
Health status change since previous year(1=much better than one year ago to 5=much worse than one year ago)	2.78 (.75)	2.82 (.74)
Expenditure at fast food/chain restaurants – average \$	\$9.06 (11.01)	\$8.30 (9.74)
Expenditure at other restaurants – average \$	\$14.25 (19.04)	\$14.32 (19.96)

Table 4: Multinomial Logit Regression Coefficients for Two Samples : Choices without fat information and Choices with fat information

		NO FAT			WITH FAT			
		Estimate	Standard Error	P-value	Estimate	Standard Error	P-value	
	PRICE	<b>-1.10</b>	<b>0.03</b>	<b>[.000]</b>	<b>-1.13</b>	<b>0.03</b>	<b>[.000]</b>	
	Chose neither of the options	<b>-8.91</b>	<b>0.17</b>	<b>[.000]</b>	<b>-21.03</b>	<b>0.36</b>	<b>[.000]</b>	
	Alternate specific constant – sodium/fat	<b>0.00</b>	<b>0.00</b>	<b>[.000]</b>	<b>-3.06</b>	<b>0.08</b>	<b>[.000]</b>	
	Alternate specific constant - higher vitamin	0.32	0.20	[.107]	<b>0.94</b>	<b>0.22</b>	<b>[.000]</b>	
	Alternate specific constant - Health Check™	<b>0.60</b>	<b>0.20</b>	<b>[.002]</b>	<b>0.58</b>	<b>0.22</b>	<b>[.008]</b>	
Interactions with sodium (NO FAT)/ fat (WITH FAT)	Age	<b>0.00</b>	<b>0.00</b>	<b>[.000]</b>	<b>0.00</b>	<b>0.00</b>	<b>[.000]</b>	
	Kids	0.00	0.00	[.245]	<b>0.07</b>	<b>0.01</b>	<b>[.000]</b>	
	Health status this year compared to last income	0.00	0.00	[.191]	<b>0.03</b>	<b>0.01</b>	<b>[.000]</b>	
	city residence	<b>0.00</b>	<b>0.00</b>	<b>[.022]</b>	<b>0.02</b>	<b>0.01</b>	<b>[.021]</b>	
	British Columbia	0.00	0.00	[.371]	0.02	0.03	[.418]	
	Ontario	0.00	0.00	[.186]	0.03	0.03	[.361]	
	Quebec	0.00	0.00	[.304]	-0.05	0.03	[.122]	
	Alberta	0.00	0.00	[.214]	<b>0.09</b>	<b>0.03</b>	<b>[.007]</b>	
	Manitoba	0.00	0.00	[.703]	<b>0.06</b>	<b>0.04</b>	<b>[.080]</b>	
	Maritime	0.00	0.00	[.728]	0.04	0.03	[.201]	
	Asked for/received nutrition info in a rest	<b>0.00</b>	<b>0.00</b>	<b>[.017]</b>	<b>-0.02</b>	<b>0.01</b>	<b>[.057]</b>	
	Eat fish but not meat	<b>0.00</b>	<b>0.00</b>	<b>[.000]</b>	<b>-0.14</b>	<b>0.04</b>	<b>[.000]</b>	
	Vegetarian	<b>0.00</b>	<b>0.00</b>	<b>[.000]</b>	<b>-0.68</b>	<b>0.06</b>	<b>[.000]</b>	
	Expenditure in fast food restaurants	<b>0.00</b>	<b>0.00</b>	<b>[.000]</b>	<b>0.00</b>	<b>0.00</b>	<b>[.010]</b>	
	Expenditure in other restaurants	0.00	0.00	[.298]	<b>0.00</b>	<b>0.00</b>	<b>[.058]</b>	
	Worry	<b>0.00</b>	<b>0.00</b>	<b>[.093]</b>	0.00	0.00	[.167]	
	Gender = female	<b>0.00</b>	<b>0.00</b>	<b>[.004]</b>	0.01	0.01	[.281]	
	interactions with	Age	0.00	0.00	[.867]	0.00	0.00	[.165]

higher vitamin	Kids	0.04	0.06	[.527]	-0.08	0.06	[.191]
	Health status this year compared to last	0.02	0.03	[.444]	-0.01	0.03	[.875]
	income	<b>0.00</b>	<b>0.00</b>	<b>[.071]</b>	0.00	0.00	[.759]
	city residence	0.00	0.05	[.997]	-0.06	0.05	[.243]
	British Columbia	-0.01	0.13	[.912]	-0.23	0.15	[.109]
	Ontario	-0.02	0.12	[.876]	<b>-0.25</b>	<b>0.14</b>	<b>[.074]</b>
	Quebec	0.03	0.12	[.783]	-0.15	0.14	[.289]
	Alberta	0.01	0.13	[.955]	-0.21	0.15	[.161]
	Manitoba	<b>-0.31</b>	<b>0.15</b>	<b>[.041]</b>	-0.18	0.17	[.287]
	Maritime	<b>0.28</b>	<b>0.15</b>	<b>[.052]</b>	-0.17	0.16	[.280]
	Asked for/received nutrition info in a rest	0.04	0.06	[.466]	0.05	0.06	[.359]
	Eat fish but not meat	0.08	0.21	[.711]	-0.08	0.20	[.674]
	Vegetarian	-0.39	0.28	[.164]	0.21	0.32	[.525]
	Expenditure in fast food restaurants	0.00	0.00	[.946]	0.00	0.00	[.763]
	Expenditure in other restaurants	<b>0.00</b>	<b>0.00</b>	<b>[.004]</b>	<b>0.00</b>	<b>0.00</b>	<b>[.045]</b>
	Worry	0.00	0.01	[.704]	0.00	0.01	[.634]
	Gender = female	<b>0.13</b>	<b>0.05</b>	<b>[.009]</b>	-0.01	0.05	[.787]
interactions with Health Check™	Age	0.00	0.00	[.723]	0.00	0.00	[.484]
	Kids	<b>0.12</b>	<b>0.06</b>	<b>[.037]</b>	<b>-0.11</b>	<b>0.06</b>	<b>[.092]</b>
	Health status this year compared to last	-0.02	0.03	[.531]	<b>-0.07</b>	<b>0.03</b>	<b>[.028]</b>
	income	0.00	0.00	[.816]	<b>0.00</b>	<b>0.00</b>	<b>[.053]</b>
	city residence	-0.01	0.05	[.887]	0.00	0.05	[.927]
	British Columbia	-0.19	0.13	[.148]	<b>-0.36</b>	<b>0.15</b>	<b>[.017]</b>
	Ontario	<b>-0.20</b>	<b>0.12</b>	<b>[.095]</b>	-0.16	0.14	[.266]
	Quebec	<b>-0.31</b>	<b>0.12</b>	<b>[.011]</b>	<b>-0.32</b>	<b>0.15</b>	<b>[.030]</b>
	Alberta	-0.19	0.13	[.146]	<b>-0.28</b>	<b>0.16</b>	<b>[.078]</b>
	Manitoba	0.05	0.16	[.759]	<b>-0.41</b>	<b>0.18</b>	<b>[.020]</b>
	Maritime	0.13	0.15	[.366]	-0.10	0.16	[.545]
	Asked for/received nutrition info in a rest	0.05	0.06	[.341]	<b>0.10</b>	<b>0.06</b>	<b>[.071]</b>
	Eat fish but not meat	<b>-0.42</b>	<b>0.19</b>	<b>[.024]</b>	-0.19	0.18	[.292]
Vegetarian	-0.42	0.27	[.118]	<b>-0.52</b>	<b>0.31</b>	<b>[.091]</b>	

Expenditure in fast food restaurants	0.00	0.00	[.693]	0.00	0.00	[.192]
Expenditure in other restaurants	0.00	0.00	[.658]	<b>0.00</b>	<b>0.00</b>	<b>[.017]</b>
Worry	<b>0.01</b>	<b>0.01</b>	<b>[.064]</b>	<b>0.02</b>	<b>0.01</b>	<b>[.006]</b>
Gender = female	0.05	0.05	[.283]	<b>0.19</b>	<b>0.05</b>	<b>[.000]</b>

Table 5: Average Willingness to Pay for Turkey Sandwich with Added Attributes

	Average \$ base sandwich price=\$4.50	Standard Error	P-value
<b>NO FAT</b>			
WTP higher vitamin content	\$0.52	0.03	[.000]
WTP higher sodium content	\$0.00	0.00	[.000]
WTP Health Check™	\$0.46	0.03	[.000]
<b>WITH FAT</b>			
WTP higher vitamin content	\$0.74	0.03	[.000]
WTP higher fat/sodium content	-\$2.75	0.09	[.000]
WTP Health Check™	\$0.48	0.03	[.000]

Table 6: Summary statistics Diet Quality for the sample that did not see fat content

	Low diet quality	Medium diet quality	High diet quality
	Mean (SD)	Mean (SD)	Mean (SD)
Diet quality	444.252 (43.168)	545.780 (24.782)	689.257 (69.540)
WTP higher vitamin	\$0.526 (0.147)	\$0.535 (0.141)	\$0.500 (0.151)
WTP sodium	-\$0.005 (0.001)	-\$0.005 (0.001)	-\$0.005 (0.001)
WTP Health Check™	\$0.459 (0.141)	\$0.470 (0.150)	\$0.458 (0.159)

Table 7: Summary statistics Diet Quality for the sample that did see fat content

	Low diet quality	Medium diet quality	High diet quality
	Mean (SD)	Mean (SD)	Mean (SD)
Diet quality	444.361 (42.711)	541.349 (24.868)	683.265 (72.945)
WTP higher vitamin	\$0.759 (0.102)	\$0.739 (0.091)	\$0.726 (0.089)
WTP <b>fat/sodium</b>	-\$2.753 (0.094)	-\$2.750 (0.112)	-\$2.746 (0.114)
WTP Health Check™	\$0.474 (0.191)	\$0.486 (0.179)	\$0.468 (0.188)


Figure 1: Example Nutrition Facts Panel: Canada

<b>Nutrition Facts</b>	
Per 9 crackers (23 g)	
Amount	% Daily Value
<b>Calories</b> 90	
<b>Fat</b> 4.5 g	7 %
Saturated 2.5 g	13 %
+ Trans 0 g	
<b>Cholesterol</b> 0 mg	
<b>Sodium</b> 280 mg	12 %
<b>Carbohydrate</b> 12 g	4 %
Fibre 1 g	4 %
Sugars 0 g	
<b>Protein</b> 3 g	
Vitamin A 0 %	Vitamin C 0 %
Calcium 2 %	Iron 8 %

Source: Health Canada <http://www.hc-sc.gc.ca/fn-an/label-etiquet/nutrition/cons/fact-fiche-eng.php>, accessed March 12, 2012.

Figure 2: Example Choice Set

During a typical visit to a restaurant when you purchase a turkey sandwich, if the following options were the only ones available, which option would you purchase?

Option A	Option B	Option C
Turkey sandwich with lettuce tomato etc. toppings		I would purchase neither of these sandwiches
Bread 2, Dressing 1 Sodium -579.81 mg – 39% DV Vitamin A – 4% DV Vitamin C – 7% DV 	Bread 2, Dressing 2 Sodium -544.69 mg – 36% DV Vitamin A – 5% DV Vitamin C – 8% DV	
\$5.00	\$5.00	

Option A

Option B

Option C



Figure 3: Distribution of WTP values across individual respondents: Health Check™

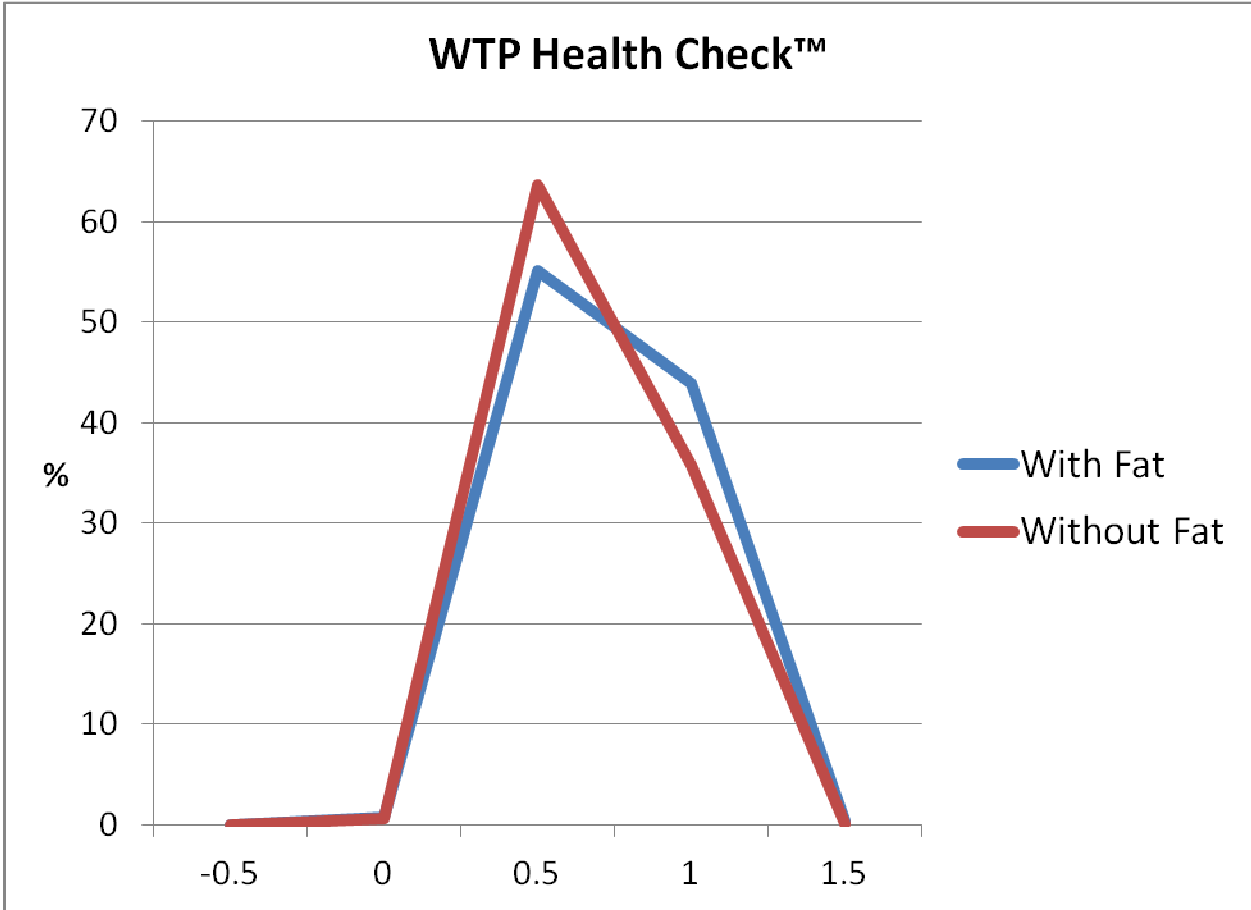


Figure 4: Distribution of WTP values across individual respondents: Higher Vitamin Content

