Nutrition Information on Food Package Labels: Consumer Use in Grocery Stores and Input on Education Issues

by

Kathy Romses

B.H.Ec., The University of Manitoba, 1981

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF Master of Arts

In

The Faculty of Graduate Studies
Department of Educational Studies
(Adult Education)

We accept this thesis as conforming to the required standard

THE UNIVERSITY OF BRITISH COLUMBIA

October 19, 2000

© Kathy Romses, 2000
In presenting this thesis in partial fulfilment of the requirements for an advanced degree at the University of British Columbia, I agree that the Library shall make it freely available for reference and study. I further agree that permission for extensive copying of this thesis for scholarly purposes may be granted by the head of my department or by his or her representatives. It is understood that copying or publication of this thesis for financial gain shall not be allowed without my written permission.

Department of Educational Studies

The University of British Columbia
Vancouver, Canada

Date Nov 15, 2000

DE-6 (2/88)
Abstract

This study investigates consumers' use of nutrition information on food package labels in a purchase decision context, obtains consumers' input on the types of education assistance they want to help them to use this information, who they believe should be providing this assistance, and their suggested methods for distributing or providing this assistance. Approximately 7% of 2,316 consumers observed choosing foods from two large grocery stores in the Greater Vancouver area were observed using the nutrition information on food package labels. Eighty-seven consumers who were using this information were interviewed in the store and 38 of these consumers were further interviewed by telephone. In-store participants shared their views on the nutrition information used to help with their purchase decision, the reasons for use, and the education assistance required to facilitate their use of this information. Telephone participants also provided their input on who should provide the education and how it should be distributed. In-store participants reported using the nutrition information primarily for limiting nutrients perceived to be harmful (fat, calories, sugar, additives, and salt). Fourteen percent of the in-store participants initially reported that they needed help using the nutrition information on the label. The percentage of telephone participants requesting help with the label increased from 13% to 47% when proposed changes to the nutrition label by Health Canada were explained. Sixty-eight percent of those requesting help wanted it directed towards increasing their understanding of the types of fats. Fifty percent of telephone participants reported that food companies should provide the educational support, followed by government (37%), health professionals (34%), grocery stores (16%), and public schools (8%). Telephone participants chose
handouts in the grocery stores in holders close to the foods, newspapers, and handouts in health offices as the top three methods of providing education information to consumers. Further research with consumers who don’t use labels is required to obtain an overall view of consumers’ perspectives. Consumers are the ultimate end users of the nutrition information on food labels, which makes their input particularly important. The results of this study are timely as Health Canada reviews its policies on nutrition labelling and nutrition claims which includes a public education component. Theories and models from adult education are used to help explain the findings.
# TABLE OF CONTENTS

Abstract ........................................................................................................ ii
List of Tables ............................................................................................... vi
Acknowledgements ...................................................................................... vii
Dedication ...................................................................................................... viii

<table>
<thead>
<tr>
<th>CHAPTER ONE</th>
<th>INTRODUCTION</th>
<th>..................................................</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Background</td>
<td>..........................................</td>
<td>1</td>
</tr>
<tr>
<td>1.2</td>
<td>Purpose</td>
<td>...........................................</td>
<td>3</td>
</tr>
<tr>
<td>1.3</td>
<td>Research Questions</td>
<td>.......................................</td>
<td>5</td>
</tr>
<tr>
<td>1.4</td>
<td>Organisation of the Thesis</td>
<td>..................................</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHAPTER TWO</th>
<th>REVIEW OF LITERATURE</th>
<th>..................................................</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Canadian Labelling</td>
<td>..........................................</td>
<td>7</td>
</tr>
<tr>
<td>2.2</td>
<td>American Labelling</td>
<td>...........................................</td>
<td>17</td>
</tr>
<tr>
<td>2.3</td>
<td>International Labelling</td>
<td>.......................................</td>
<td>23</td>
</tr>
<tr>
<td>2.4</td>
<td>Education Literature</td>
<td>.......................................................</td>
<td>27</td>
</tr>
<tr>
<td>2.5</td>
<td>Summary</td>
<td>........................................</td>
<td>30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHAPTER THREE</th>
<th>RESEARCH METHODOLOGY</th>
<th>..................................................</th>
<th>35</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Research Design</td>
<td>..........................................</td>
<td>35</td>
</tr>
<tr>
<td>3.2</td>
<td>Questionnaire Development</td>
<td>.......................................</td>
<td>37</td>
</tr>
<tr>
<td>3.3</td>
<td>Research Sites</td>
<td>........................................</td>
<td>38</td>
</tr>
<tr>
<td>3.4</td>
<td>Procedure</td>
<td>...........................................</td>
<td>39</td>
</tr>
<tr>
<td>3.5</td>
<td>Pilot Study and Modifications</td>
<td>..................................</td>
<td>42</td>
</tr>
<tr>
<td>3.6</td>
<td>Analysis</td>
<td>........................................</td>
<td>44</td>
</tr>
<tr>
<td>3.7</td>
<td>Summary</td>
<td>........................................</td>
<td>46</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHAPTER FOUR</th>
<th>FINDINGS</th>
<th>..................................................</th>
<th>47</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>Consumer Use of Nutrition Information</td>
<td>........................................</td>
<td>47</td>
</tr>
<tr>
<td>4.2</td>
<td>Nutrition Information Used</td>
<td>...........................................</td>
<td>50</td>
</tr>
<tr>
<td>4.3</td>
<td>Reasons for Use</td>
<td>..................................................</td>
<td>53</td>
</tr>
<tr>
<td>4.4</td>
<td>Need for Education Assistance</td>
<td>........................................</td>
<td>55</td>
</tr>
<tr>
<td>4.5</td>
<td>Who Should Provide the Education Assistance</td>
<td>..................................</td>
<td>58</td>
</tr>
<tr>
<td>4.6</td>
<td>Methods for Providing Education to Consumers</td>
<td>..................................</td>
<td>59</td>
</tr>
<tr>
<td>4.7</td>
<td>Summary</td>
<td>........................................</td>
<td>60</td>
</tr>
<tr>
<td>CHAPTER FIVE</td>
<td>DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS</td>
<td>62</td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>---------------------------------------------</td>
<td>----</td>
<td></td>
</tr>
<tr>
<td>5.1 Discussion</td>
<td>62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.2 Conclusions</td>
<td>76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.3 Recommendations</td>
<td>77</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

References ............................................................... 80

Appendix A  Examples of Canadian Ingredient List, Nutrition Label and Nutrition Claim ........................................... 86
Appendix B  Example of the Proposed, “Nutrition Facts” Nutrition Label and Highlights from the Proposed Nutrition Labelling Policy .......................................................... 87
Appendix C  Glossary of Terms ........................................ 88
Appendix D  In-Store Questionnaire .................................. 89
Appendix E  Telephone Questionnaire ................................ 91
Appendix F  Consent Form ................................................ 94
List of Tables

Table 1. Consumers Observed and Interviewed for Each Store Visit .................. 49
Table 2. Demographic Profiles for Participants from the North Vancouver and Surrey Locations ................................................................. 51
Table 3. Nutrition Information Used by In-store Participants .......................... 52
Table 4. Reported Reasons for Using Nutrition Information by In-store Participants .... 54
Table 5. Demographic Profile of Study Participants Compared to the National Institute of Nutrition (1997) Study ....................................................... 65
Acknowledgements

I would like to extend my sincere thanks to the participants for their time and thoughtful responses. I would also like to thank the Canadian Home Economics Association Foundation and the British Columbia Dairy Foundation for the research grants, which supported this study and the Beef Information Centre for providing the use of a photocopier.

I am also grateful for the time and expertise provided by my research supervisor, Dr. Linda Peterat and committee members, Dr. Ryna Levy Milne and Dr. Thomas J. Sork. My sister-in-law, Lise Olsen, also helped by reviewing my thesis and providing her comments on how to improve the final report.

Lastly, I would like to thank my children Sandra, Cameron and Nicole who took on more responsibilities to help me to attain my goal of obtaining my Masters degree.
Dedication

This research is dedicated to the loving memory of my mother, Patricia H. Romses, who believed in me and taught me that I can do anything that I put my mind to.
CHAPTER ONE
INTRODUCTION

Background

There has been a shift in the focus of health care from the treatment of communicable diseases to the prevention of chronic diseases by governments in Canada, the United States, Australia, New Zealand, and some European countries (Green & Ottoson, 1994). A compelling reason to shift national health expenditures from medical care to programs that focus on lifestyle and the environment is related to the costs and benefits of these expenditures. Approximately 90% of North American health expenditures are on medical care that contributes less than 20% to mortality reduction or increased longevity (Green & Ottoson, 1994). Expenditures directed towards lifestyle and behaviour determinants of health are estimated to be less than 5% while they influence health outcomes by approximately 50% (L. W. Green, personal communication, January 15, 1998).

The choice of food is a lifestyle factor related to chronic diseases including cardiovascular disease, diabetes, osteoporosis, obesity and cancer (Health Canada, 2000). These diseases result in premature death and disability for many people. The choice of food and activity patterns are second only to tobacco for non-genetic factors that contribute to mortality (Health Canada, 2000). Regulatory policies related to nutrition information on food package labels are a health promotion initiative undertaken by the governments of Canada, the United States, Australia, New Zealand, and some European countries intended to influence people's food choices. The purpose of the policies is to provide consistent, understandable and useful information to help consumers make
healthful food choices. It is also intended to encourage food companies to produce healthier foods (Health Canada, 2000). If consumers used the information to choose healthier foods, this would improve their nutritional health which should result in lowered medical costs, improved economic productivity, and increased quality of life (Joint Steering Committee, 1996). Nutrition information on food packages includes the ingredient list, nutrition label, nutrition claims, and in some countries, health claims.

The ingredient list is mandatory on all packaged food labels in Canada, the United States, Australia, New Zealand, and most European countries. Nutrition labelling is mandatory for packaged food in the United States and voluntary in the remaining countries. Voluntary nutrition labelling and nutrition claims have existed in Canada since 1988. An example of a Canadian ingredient list, nutrition label, and a nutrition claim are included in Appendix A. A review of this voluntary system is currently being coordinated by Health Canada (1999). Although health claims are not allowed on Canadian food packages, this policy is also under review. Policy statements and implementation were planned for the fall of 1999. At the present time, an announcement has not been made. The vision statement for nutrition labelling that has been developed as a result of nation-wide consultations is, “An improved nutrition labelling system which, combined with public education, reinforces healthy eating practices and enhances the nutritional well-being of Canadians” (Health Canada, 1999, p. 2). Expanding the availability of information does not necessarily increase knowledge (Green & Kreuter, 1999) or produce

---

1 Health Canada announced a new nutrition labelling policy proposal on October 19, 2000. An example of the new, Nutrition Facts label and highlights from the policy proposal are included in Appendix B.
the changes in behaviour that are required to improve the diets of the population. Nutrition information on food package labels is a nutrition education tool that reaches all consumers who purchase foods. The label cannot improve the diets of Canadians without comprehensive education (Health Canada, 2000). Few consumer education programs have addressed nutrition labelling in Canada (Reid, 1992). The proposed changes for nutrition labelling regulations highlight the need for consumer research on their educational needs.

The necessary starting point for developing comprehensive education programs is to determine the current use of nutrition information on food package labels (Derby & Fein, 1995) and to obtain consumer input on the education assistance required to facilitate their use of this information. Providing education directed towards what consumers want to know rather than what health professionals think they should know could be the key to improving the effectiveness of nutrition education programs (McNutt, 1992). The results from decades of research and experience indicates that participants are more committed to initiating and maintaining those changes that they helped design to suit their own purposes and circumstances (Green & Kreuter, 1999). Guthrie, Derby, and Levy (1999, July) propose that more targeted, in-depth research be conducted with consumers to determine the type of help they need and desire. The findings should be used to plan nutrition education and promotion campaigns.

Purpose

This study investigates consumers’ use of nutrition information on food package labels in a purchase decision context, obtains consumers’ input on the types of education
assistance they want to help them to use this information, who they believe should be providing this assistance, and their suggested methods for distributing or providing this assistance.

Factors that affect a consumer’s choice of food include taste, cost, convenience, nutrition (National Institute of Nutrition, 1998), brand, quality (Shine, O’Reilly, & O’Sullivan, 1997b), and their health status (Guthrie, Fox, Cleveland, & Welsh, 1995). Studying consumers in the actual place where they use the nutrition information on food package labels provides greater insight into the way that consumers use this information for food purchasing decisions (Shine et al., 1997b; Wilson, 1993). There is very little published literature that examines consumers’ use of nutrition information on food package labels in a purchase decision context. As well, most of the research has examined consumers’ use and understanding of the nutrition label in isolation from the ingredient list and nutrition claims which also appear on food package labels. The methods used in these studies are not able to examine the use of nutrition information in the actual context where there are many pieces of information to choose from and time constraints are often present.

area. There are very few studies that have asked consumers for their input on education issues. Their input is important because participation in the planning of education programs by members of the target audience is necessary to plan relevant, effective programs (Boyle, 1981; Caffarella, 1994; Green & Kreuter, 1999; Houle, 1996; Knowles, 1980). This study will address this gap in the existing research and provide the necessary information from the consumers’ perspective. Furthermore, an announcement on changes to nutrition labelling regulations in Canada is imminent, which makes the results of this study particularly timely.

**Research Questions**

This study will address the following questions:

- What is the prevalence of use of the nutrition information on food package labels in making the purchase decision?
- What parts of the label do consumers, who use nutrition information on food package labels, use in deciding whether or not to purchase a product?
- What types of education assistance do consumers, who use nutrition information on food package labels, want to help them use this information?
- Who do consumers, who use nutrition information on food package labels, believe should provide the education assistance to facilitate the use of this information?
- How do consumers, who use nutrition information on food package labels, believe the education assistance should be distributed or provided to consumers?
The answers to these questions will be useful for planning relevant educational programs to help Canadian consumers make optimal use of the nutrition information on food package labels.

**Organization of the Thesis**

The thesis is presented in five chapters. The literature review follows this introductory chapter. It includes a review of relevant literature, broken down into the categories of Canadian, American, international labelling research, and education literature as well as a summary. Chapter three outlines the research methodology used. The research design, questionnaire development, research sites, procedure, pilot study and modifications, and a description of the steps taken to analyze the data are described. The findings are discussed in chapter four under the headings of consumer use of nutrition information, nutrition information used, reasons for use, need for education assistance, who should provide education assistance, and methods for providing education to consumers. The fifth chapter begins with a discussion of the results and is followed by limitations, conclusions, and recommendations for further research, policy makers, and education providers. A glossary of terms used throughout the thesis is included in Appendix C.
It is important to review and critique existing literature to determine the gaps in existing research. Education related research on nutrition labelling is limited. The literature reviewed is divided into Canadian, American and international nutrition labelling research followed by education literature related to adults. The education literature provides insight into the theory and practice of adult education or andragogy. It also describes two models that can be used to help understand consumers’ use or non-use of nutrition information on food package labels and to help plan education programs to facilitate the use of this information. The summary provides reasons why the present study is necessary.

**Canadian Labelling**

Canadian research related to nutrition information on food packages has increased in the past few years to provide direction for the current review of nutrition labelling and nutrition claims. The National Institute of Nutrition has conducted most of the published Canadian research related to nutrition labelling. The Institute is a private, non-profit organization formed to serve as a credible, objective source on nutrition issues, to foster nutrition research and education in Canada, and to inform nutrition-related public policy discussions. The Joint Steering Committee (1996) was formed to develop a national nutrition plan for Canada and supported nutrition labelling as a way to strengthen healthy eating practices. They also recommended expanded public education on its use.
A National Institute of Nutrition study was conducted to gain an understanding of the best method to communicate nutrition concepts on food package labels (Reid, 1992). The project consisted of three phases. Phase one included three focus groups with a total of 28 participants. The purpose of this phase was to refine an interview questionnaire for the main data collection. In phase two, the questionnaire was used to explore the attitudes and behaviours of 820 principal grocery shoppers. The interview included three behavioural tests using actual food packages. Three brands in each of eight different food categories were used in the behaviour tests to determine how nutrition information influences food choices. Phase three explored consumers' understanding of concepts related to fat and cholesterol, using data from 150 mall intercepts with principal grocery shoppers.

Participants reported the following levels of importance, understanding, and usability of ingredient lists (82%, 77%, 78%), nutrition claims (78%, 83%, 75%), and nutrition labels (74%, 71%, 70%), respectively. For those consumers who read the nutrition information on food package labels, most used them in the store to choose between products (71%) or when buying a new product (46%). Only 3% to 6% reported using them at home.

In behavioural test situations, only one person in four used the nutrition information for choosing foods despite their reported importance. This result is perplexing considering the fact that 64% of the sample reported that they use food packages as a source of nutrition information and 70% reported that nutrition is extremely or very important in choosing food. Complexity and lack of clarity were the main criticisms by those who did not find the ingredient list and nutrition label usable.
Credibility was the main obstacle for nutrition claims use. When participants were asked whether they were very or pretty sure of the meaning of nutrition claims, the percentage that was able to give a functionally correct definition was significantly lower than reported understanding for almost all claims. One of the key recommendations from the study was the importance and need for consumer education to facilitate consumers’ use of nutrition information.

The limitations of this study are that there was no indication of the number of people who refused to take part in the studies or whether the income level was representative of those for the Canadian population. The second and third phase appeared to have a large number of participants who were from the higher household income level group (55% and 66% respectively of the households earned more than $40,000/year). Single people were under represented in the sample. Sampling was disproportionate to city population for the five cities to allow analysable samples in all cities.

Although nutrition labelling is voluntary in Canada, according to a 1998 member survey of the Food and Consumer Products Manufacturers of Canada (2000), more than 65% of members’ products provide nutrition labels. This organization supplies approximately 75% of the food and beverages available to Canadian consumers. The organization mailed questionnaires to 1,000 consumers from the Dialogue Canada consumer panel (Food and Consumer Products Manufacturers of Canada, 1996). The panel members have agreed to participate in occasional research studies to serve as a source of consumer opinion. It is a representative sample designed to reflect the profile of all Canadian households. The results of interest to the present study include: women
make up 85% of all primary grocery shoppers; the average main grocery shopping trip takes 44 minutes; fat, calories, and a list of ingredients were the top three nutrition information priorities; 59% reported that their diet could be healthier; and 47% of the respondents reported difficulty understanding nutrition terms on labels. The two most important priorities that consumers would set for the grocery industry were ensuring the safety of food products and providing nutrition information on packaged food labels. The interest in shopping and other variables related to shopping may be higher for this panel than the average Canadian because panel members' were willing to take the time and effort necessary to take part in occasional research studies.

The National Institute of Nutrition (1997) tracked the knowledge, attitudes, and reported behaviour of adult Canadians with respect to nutrition for the years 1989, 1994, and 1997. The surveys used a national probability sample of approximately 2,000 adults aged 18 years and older for each year, to represent all Canadians with the exception of those living in the Northwest Territories. A set of core questions was used in all the sampling periods.

Findings from these surveys included a decline in men's level of interest in nutrition between 1989 and 1997, widening the gender gap from 13% to 22% in 1997. Overall, a hectic lifestyle was reported as the main barrier to healthy eating. The rating of product label usage, interest in nutrition and knowledge of nutrition were found to be positively correlated with self-ratings of eating habits. Product labels followed by radio/television and friends/relatives/colleagues were the most frequently identified source of nutrition information chosen from a list of sources. Approximately one-quarter of the respondents reported having difficulty understanding the information provided on
labels. When shown a list of nutrition terms, 89% of respondents reported some awareness of the term, saturated fat, but only 46% of these respondents reported that they knew the meaning of the term. When knowledge of this term was tested, two thirds of those who claimed to know the meaning were able to give a correct definition. For the term, trans fatty acids, 57% had heard of the term and 17% of these respondents reported they knew the meaning of the term. The authors recommend increased targeting of messages to different segments of the population and providing information that is directed to consumer concerns. There was no indication of the number of consumers who refused to participate in the study.

The National Institute of Nutrition (1998) report critically analyzed the literature reviewed to explore the similarities and differences between Canadian and American labelling systems, public health guidelines, and consumer use and awareness of nutrition labelling. Canadian nutrition recommendations and guidelines for healthy eating and nutrition labelling formats differ from the United States. The National Institute of Nutrition proposes that caution be applied in using the American label as a reference point and advises that a Canadian labelling system be developed that recognizes the differences outlined in health promotion objectives. They advocate for the development of a nutrition label\textsuperscript{2} based on research and supported by consumer education.

\textsuperscript{2} The National Institute of Nutrition started to use the term, nutrition information panel, to refer to the nutrition label. This term was also used in the 1999 study. To avoid confusion, the present study uses the term, nutrition label.
In 1999, the National Institute of Nutrition was commissioned by Agriculture and Agri-Food Canada, Health Canada, the Heart and Stroke Foundation of Canada, and food related organizations to conduct research on consumer attitudes and behaviour related to nutrition labelling and to determine performance and preferences amongst nutrition label options. Six test labels that incorporated two alternative methods of declaring nutrient content and three different bilingual formats were used to assess performance or the ability of consumers to use the nutrition information. Personal interviews were conducted with a cross-section of 1,105 Canadians 18 years or older.

Findings from the study indicate that: 93% of the consumers surveyed want to see the nutrition label on all or most foods; 90% consider nutrition as extremely, very or quite important in choosing food; 71% claim that the nutrition related information on package labels plays at least quite an important factor in their food choices; and 70% indicate that they use the nutrition label often or sometimes. There was no indication of what the terms often or sometimes referred to. The definition of these terms may vary between respondents unless more specific meanings are attached to these terms. Label users tend to be women with higher levels of education and income. Barriers to using the nutrition information tended to be higher for older Canadians and those who have lower education or income levels. The results were not broken down into age categories so the reader has to rely on the authors’ interpretation of the findings. The most liked or useful information on food labels was fat (46%), ingredients (17%), calories (16%), sugar (11%), and salt (9%). Seventy-five percent of consumers reported that they referred often or sometimes to nutrition claims. The nutrition label and ingredient listing were both reportedly used by 70% of consumers. Consumers tended to use labels for:
determining the nutrient composition for specific nutrients like fat, sodium, fibre, vitamins or minerals; to get a general idea of the calorie content of a food; and for comparing similar or different foods. Participants with diabetes or heart disease, who have special dietary needs, reported a lower level of understanding of the nutrition label. Participants with diabetes expressed higher levels of interest and use of the nutrition label.

Although 83% indicated that they had some understanding of the information provided by the nutrition label, only 43% of these participants stated they understood it very well and 17% claimed that it was difficult to understand. This research relied primarily upon participants’ reported levels of understanding versus probing to determine whether they understood the terms. The difference between reported and real understanding was evident in the results which found a difference in the number of consumers who claimed to understand energy (69%) and calorie (87%) terms well. In fact, these terms mean the same thing. Reported understanding for saturated and trans fat were 53% and 17%, respectively. This is low considering the proposed additions of these nutrients to the core list of nutrients in Canada. When consumers were asked to determine the number of 150 mL servings in a 300 mL bottle of juice, only 35% answered the question correctly.

A question related to the preference of presentation for nutrient information in terms of absolute amounts (g and mg) or relative amounts (% RDI-Reference Daily Intake) resulted in a change in preference for the % RDI after the term was explained. These research results may be useful to guide the planning for education programs, although a gap in understanding does not necessarily identify an educational need that is
of interest to the consumer. This report also did not give any indication of the number of consumers who refused to take part in the study.

The 1994-95 National Population Health Survey found that 45% of men and 47% of women rated their eating habits as excellent or very good and 16% of both men and women rated their eating habits as fair or poor (Federal, Provincial & Territorial Advisory Committee on Population Health, 1999). The low ratings were more prevalent in lower income versus upper income respondents. Fifty-nine percent of Canadians aged 12 years and over were concerned about dietary fat and reported they were taking action to decrease their consumption of fat. This was more prevalent with women (67%) than men (50%). Forty percent of Canadians in the lowest income bracket believed that low fat foods are expensive compared with 32% of those in the highest income bracket. This information was taken from an unpublished report and there was very limited information on the methodology or findings.

In 1999, Health Canada (1999, October) undertook a review, which analyzed 183 stakeholder responses to the Nutrition Labelling Policy Review Consultation Kit. The Kit, included 15 theme-related questions, primarily open-ended in nature. It was distributed to key national, regional, and local stakeholder groups and individuals. Recipients were encouraged to copy the kit for their members to fill in. A copy of the kit was also posted on the Health Canada Web site. Responses were received from individuals and organizations from industry, health, education, non-government and government sectors, as well as four consumer groups, the media, and 32 members of the public. The results were organized into five main themes; content, format, availability, education, and cross-cutting and emerging issues. Under the content theme, it is
proposed that the core nutrient list that must be included every time a nutrition label appears be expanded from the current serving size, energy or calories, protein, fat, and carbohydrate to include saturated fat, trans fat, fibre, sodium, calcium, and iron. These nutrients were chosen because of their relationship to diseases of public health significance (Health Canada, 1999). Most respondents were in favour of the core list of nutrients except for the industry group. There was no indication of the number of respondents represented in the analysis of responses. The main areas of agreement for a public education program were:

- accounting for consumers varied needs for information;
- providing information to match different learning styles;
- Health Canada should provide leadership;
- program delivery methods through a wide variety of public and private organizations to ensure that consumers receive the messages many times, in many ways, through many channels.

Health Canada (2000) received 1,541 pieces of correspondence from the public on the topic of nutrition labelling between January 1996 and January 1998. Nine hundred and eighty-nine pieces of this correspondence were received as a result of two write-in campaigns organized by two Canadian consumer groups, Take Off Pounds Sensibly (TOPS) and the Center for Science in the Public Interest (CSPI). Consumers wrote that they wanted nutrition labels to help with their food purchasing decisions. They wanted to be able to choose foods that will contribute to a healthy lifestyle, prevent chronic diseases/conditions, and manage diet-related diseases/conditions. There was no
Health Canada (1999, November) posted four questions on their web site under the heading, “Nutrition labelling? What’s your opinion?”, to obtain the views of consumers on specific nutrition labelling issues. The four questions posted were:

- Do you agree with the core list of nutrients?
- Since nutrition information is given per serving, is it important to provide the number of servings per package?
- Should nutrition labelling be mandatory?
- Is there any part of the panel that you would have trouble using without further information?

A total of 625 responses were received between July and September 1999, with 568 respondents from the consumer category. Most respondents agreed with the proposed core list but wanted more information added. Respondents were “overwhelmingly” in favour of listing the number of servings per package. “Not personally”, was the most common response to the last question relating to education. Comments from respondents focused on wanting help with the types of fat and carbohydrates and the proposed daily reference values (% RDI). Most of these respondents believed that they were relatively well-informed about nutrition. Many of these respondents acknowledged that other consumers might have difficulty using the nutrition panel without further information. There is no indication of the number of consumers providing the various responses in the report, which makes the results difficult to interpret. It would be interesting to know whether the respondents are nutrition
information label users. This survey represents the views of a non-random sample of people who have access to the internet and are interested in nutrition labelling issues.

American Labelling

Voluntary nutrition labelling was introduced in the United States in 1973 (Levy & Fein, 1998). The United States Nutrition Labeling and Education Act (NLEA) was passed in 1990 and implementing regulations were issued in 1993 (Levy & Fein, 1998). These regulations made revised nutrition labelling formats mandatory for most packaged foods and included standardized definitions for nutrition claims. Nutrition labelling remains voluntary for raw produce, fish, meat, and poultry products (Health Canada, 2000). The Act also mandated consumer education for all Americans (Kulakow, 1995). The National Exchange on Food Labeling Education (NEFLE) was formed to build partnerships with government and non-government organizations. The NEFLE encourages members to pool ideas and funds in an attempt to reach the goal of educating all Americans on the nutrition label. These events marked the beginning of increased research on nutrition labelling.

The ultimate goal of nutrition labelling is for consumers to use the information to make healthier food choices. Support for this outcome was found in a 1997 Food Marketing Institute (FMI) survey (Guthrie et al., 1999) where one in four shoppers reported that they started purchasing a product because of something they had read on the nutrition label. The same study found that one in three had stopped buying a product for the same reason. Fat content was cited as the main reason for causing these changes. In
a study by Neuhouser, Kristal, and Patterson (1999), fat, calories and cholesterol were found to be the most frequently read parts of the nutrition label.

Cole and Balasubramanian (1993) conducted a two-part study on consumer use of nutritional information to determine whether consumers aged 60 years and older could use the information as accurately as younger consumers could. In the first part of the study, 79 consumers were observed and interviewed in the cereal aisle of three chain grocery stores in a midwestern university town. Consumers looked at the nutrition label on 5% of the cereals they inspected and 29% reported that nutrition was the reason they chose that cereal. Possible explanations provided by the authors for the low observed rate of use were that consumers may believe that all cereals have equal nutritional attributes, they may have read the nutrition label in the past, or they may use other factors such as the appearance and taste for their purchasing decision. Guthrie et al. (1995) reported that self-reports of label use may be overestimated due to social desirability bias.

The consumers observed in the store were also assigned the task of choosing a cereal with less than 200 milligrams of sodium and at least 2 grams of fibre in a serving. Consumers under the age of 60 searched the nutrition information on the labels of more boxes of cereal and were more likely to make a choice that met the criteria than older adults. Similar results were found in the second part of the study that was conducted with different participants in a laboratory setting. There was no indication of the number of participants who participated in this part of the study. A computer program was used to have participants choose between five brands of cereal labelled with the letters A to E to avoid familiarity with cereal brands affecting the results. The authors attributed the differences between older and younger consumers to age related changes in information.
processing abilities. Consumers over the age of 60 may not have been familiar with computers. The authors neglected to explore whether the use of a computer exercise for choosing between cereals had an effect on the results.

Levy and Fein (1998) studied consumers' ability to perform various tasks with the nutrition label. These authors conducted an experimental, mall-intercept study, which tested 384 subjects on a comparison task and 800 subjects on the remaining tasks. Seventy-eight percent of subjects accurately compared two products, 58% accurately evaluated nutrient level claims, 45% correctly used the label to balance nutrients for a daily diet, and 20% used the label to calculate the contribution of a single food to a daily diet. An analysis of the results found that subjects over 55 years of age, non-white people, those with less education, and those with a diet-related health condition performed poorer than younger people, white subjects, college graduates, and those without diet-related health conditions. Subjects who reported not reading labels also had lower levels of performance on the label tasks. The authors conclude that dietary guidance for consumers will be more effective if it is targeted to easier tasks that do not require mathematical calculations. There was no indication of the time required to complete each task.

In a 1997 survey study using 885 adult patients, Kreuter, Brennan, Scharff, and Lukwago found a relationship between patients reporting diets lower in fat, higher in fruits, vegetables, and fibre and their likelihood of reading nutrition labels. Patients with hypertension or elevated cholesterol levels were more likely than other patients to read sodium and fat information on labels, respectively, but not other parts of the label. Neuhouser et al. (1999) found that 80% of a sample of 1,450 randomly chosen adults
used nutrition labels and that use was associated with lower fat intake. The study did not find a statistically significant relationship between persons with a history of chronic diseases, which often include dietary treatments, and label use when statistical adjustments were made for demographic variables. The study by Kreuter et al. (1997) may not have made adjustments for demographic variables that affect label use.

A comprehensive model has been developed to measure the relationship between nutrition knowledge, diet-health awareness, and other factors and a person’s Healthy Eating Index (HEI) (Variyam, Blaylock, Smallwood, & Basiotis, 1999). The United States Department of Agriculture (USDA) introduced the HEI in 1995 as a measure of overall diet quality. An analysis, based on the model, indicated that nutrition knowledge and a person’s HEI are positively correlated. Other influencing factors on the HEI are income and education levels, race, ethnicity, and age. The authors reported that when sociodemographic characteristics are controlled, individuals scoring higher on nutrition knowledge also scored higher on the HEI scale.

The authors suggest that the informational advantage that is associated with income and education can be minimised by targeting nutrition education programs to low income or education groups. This is a very complex model that lends additional support to the assumption that increased nutrition information may lead to increased nutrition knowledge which in turn can result in improved health. The authors tend to underestimate other factors that influence what foods are available and the individual’s ability to make choices in terms of proximity of grocery stores, transportation difficulties, limited time, and low literacy skills.
Guthrie et al. (1997) studied the characteristics associated with nutrition label use using data from the United States Department of Agriculture’s 1989 Continuing Survey of Food Intakes by Individuals and Diet and from the Health Knowledge Survey. In each survey, data was collected from approximately 2,000 households. The characteristics associated with label use included having at least some college education, having a higher income, being female, living with others rather than living alone, being more knowledgeable about nutrition, believing in the importance of following the principles of the Dietary Guidelines for Americans, and being more concerned about nutrition and food safety and less about taste for choosing foods. Approximately 71% of the main meal planners/preparers from the sample reported using the nutrition label sometimes or always.

This literature review identified only two studies that evaluated educational interventions directed towards the food label. A pretest-posttest control group design was used to determine the effect of a nine week food label education program developed specifically for women with type 2 diabetes mellitus (Miller, Jensen, & Achterberg, 1999). Dietary planning is an essential component for the successful management of diabetes. Declarative and procedural knowledge as well as perceived confidence were statistically increased as a result of the education program. This result is expected due to the intensity of the program and the interest of participants in the nutrient content of food. The results are useful for planning education programs that are directed towards specific disease states related to diet as well as for advocating for the implementation of education programs. However, the applicability of a nine-week education program for the general population is limited.
The second study attempted to determine whether prior educational experience with labels was related to label-reading knowledge, attitudes, and behaviours (Marietta, Welshimer, & Anderson, 1999). A survey was conducted with 208 undergraduate students enrolled in general education classes. Just over half of the students reported previous educational experience with labels. The conclusion reported that prior educational experience with labels was positively correlated with greater knowledge, more favourable attitudes and increased label use. However, the results portion of the report stated that attitudes were not influenced significantly by previous educational experience.

Moorman (1996) utilized a longitudinal, quasi-experimental design with data collection eight months before the NLEA deadline for mandatory nutrition labelling and five months following the deadline. Consumers were observed in two supermarkets in each of three different cities. Participants were randomly selected from supermarket aisles when they picked up a product from 20 different categories. Consumers were asked to recall some nutrition information from the last product that they chose and to fill in a one-page survey. A total of 554 participants in the pre-NLEA and 558 in the post-NLEA periods were surveyed. The results indicate that: respondents spent more time using the information, particularly for unhealthy foods; comprehension differences across healthy and unhealthy products were decreased; and consumers acquired and comprehended more nutrition information for the post NLEA period. Also, several of the consumer knowledge variables, including label and diet knowledge, became insignificant predictors of nutrition information comprehension in the post-NLEA period.
Many food companies may have changed their labels to comply with the regulations before the pre-NLEA portion of the study was conducted. There was no indication of how many changes were noticed for labels in the product categories chosen. This would tend to minimise the effects of the NLEA on the variables studied. The deadline for implementation was probably accompanied by promotional activities, which would tend to increase the use of the information in the post-NLEA portion of the study. Also, nutrition information comprehension was based on total fat-recall accuracy. Although fat is the part of the label most often used by consumers, for some of the foods studied (e.g. orange juice), this would not be a part of the label that most consumers would use. Therefore a judgement of comprehension based on total fat-recall accuracy is not appropriate for all foods.

**International Labelling**

International Guidelines on Nutrition Labelling were adopted by the Codex Alimentarius Commission in 1985 (Health Canada, 2000). This Commission is part of the Food and Agricultural Organization of the United Nations World Health Organization. In 1998, 163 countries were members, representing 97% of the world population (Food and Agricultural Organization of the United Nations, 2000). Voluntary nutrition labelling was instituted in the European Community in 1990 (Health Canada, 2000).

Wandel (1997) conducted a two-part study in Norway. In the first part, a qualitative pilot study consisting of in-depth interviews using an interview guide in 25 households was used to formulate questions for the survey and to obtain qualitative data.
The second part was a quantitative survey study with a representative sample of 1,050 persons from Norway. The pilot study revealed that consumers have difficulties understanding the terminology used on labels. They dealt with this problem by using labels to a limited extent or not at all, or focusing on a relatively small part of the label that they were able to understand and use, or using the set of ingredients or contents that they always used. They tended to use labels for the substances that they wanted to avoid or reduce their intake of. This approach was used by some of the participants because they thought that they received enough vitamins and protein from fresh foods, such as fruits, vegetables, and fish in their diet.

The survey portion of the study reported that 79% often, sometimes or seldom read the food label. For those who did read food labels, the most common parts they used were additives, fat, and energy. The areas that consumers want more or better information included additives, the food cultivation process, and environmental contaminants. This was followed in importance by ingredients and nutrition content information. The desire for more information on additives was probably influenced by the concern of some consumer groups over harmonisation of the food market with European additive regulations. The harmonisation could result in an increased use of a larger variety of additives in Norway. Also, the author has written a critique on the use of additives used in industrialised food. This may have biased the way that the author worded the questions or ordered the responses. This was reflected in the amount of discussion related to additives. The category used to report the percentage of consumers who read the label, often, sometimes, or seldom, is too large to get a good indication of the amount the label is used.
Shine et al. (1997a, 1997b) conducted in-store surveys with 200 primary grocery shoppers in the Cork region of Ireland. Fifty-eight percent of respondents claim to read nutrition labels. Label readers tended to be women who have completed tertiary education. The two main reasons for not using nutrition labels were that they were not interested and that they do not have sufficient time to read and evaluate them. Positive attitudes towards nutrition, reported and tested knowledge of nutrition, positive attitudes to the diet-disease relationship, and awareness of particular food components related to heart disease, diabetes and birth defects, were all significantly related with the use of nutrition labels. However, 67% were unable to state what constituted a balanced diet and two-thirds of the sample were not familiar with the term RDA (recommended daily allowance). Most respondents reported using labels to know what they were eating and to determine the nutrient content of foods. Eighty-nine percent claimed that they sometimes change their mind about purchasing a product once they have read the nutrition label.

When consumers were asked to rank a list of six product attributes in order of importance, quality (32%), nutrition (25%), taste (23%), and price (16%), were followed by convenience and brand. Eighty-one percent of respondents and 92% of those who read labels reported that they would be interested in obtaining further information about nutrition. The authors recommend that food industry and government co-operation is essential for the implementation of a successful nutrition education program.

A conflicting result was found under the section of why nutrition labels were used. Seven percent reported that they use labels to compare brands of the same product type, whereas, in another section on impact, 73% claimed to use labels to aid in product
comparisons. This may be attributed to the way the question was asked and whether it was a closed or open-ended question. Although a significant relationship was reported in the conclusion between nutritional content of food products and use of nutrition labels, there was no mention of how this was determined. There was no indication of response rate and there were a large percentage of relatively well-educated participants (45% tertiary education).

A postal survey conducted by Scott and Worsley (1997) during 1990 in New Zealand, with 300 respondents, found that 92% were in favour of compulsory nutrition labelling on packaged foods. Sixty percent claimed to have used nutrition labels in the past ten days, and 68% claimed to return food to the shelf if it did not have the right amount or kinds of nutrients that interested them. Nutrients that are normally recommended to be decreased, such as fat, cholesterol, and sugar are reportedly used more frequently and respondents also claimed they knew more about these nutrients. This finding is similar to several other studies cited in the report. Cholesterol, fat, dietary fibre, and salt were the most common responses when consumers were asked to choose three items they would like included on a label. A significant relationship was found between knowledge about a nutrition term and frequency of use for that nutrient on nutrition labels. The three main reasons for using nutrition labels were for health maintenance, for first time purchases, and for comparing different brands of foods. More women and primary grocery shoppers versus occasional shoppers reported reading nutrition labels. The sample was relatively well educated compared to the general population demographics and 70% were the primary grocery shopper.
Education Literature

The theory and practice of adult education, or andragogy, acknowledges the needs, experience, and self-directed nature of adult learners (Knowles, 1980). Pedagogy, or the art and science of teaching children, is based on the traditional transmittal of knowledge and skills by the teacher to the learner (Knowles, 1980). Pedagogy and andragogy are now viewed as a continuum ranging from teacher-directed to student-directed learning (Merriam, 1993). The situation directs the appropriateness of the approach. For example, adults who know very little about a subject may benefit from a teacher-directed approach until they have enough knowledge to be motivated and able to direct their own learning. The main distinguishing features about adult learning from childhood learning are the independent and therefore the self-directed nature of adults (Merriam, 1993) and the diversity of ages, psycho-social and physical development stages, ability to use complex problem solving strategies, and experiences within a group of adult learners (Darkenwald & Merriam, 1982). Andragogy does provide a set of guidelines for working with adults who are self-directed learners. In self-directed versus more traditional approaches to learning, the learner assumes the primary responsibility for planning, implementing, and evaluating the learning experiences (Caffarella, 1993). The needs of the learner and the learner’s experience are central to the adult learning process (Caffarella, 1993). An understanding of the needs and the experiences of adult learners is necessary to facilitate learning experiences (Darkenwald & Merriam, 1982). The “teachable moment” for adults depends primarily upon immediate problems or tasks (Darkenwald & Merriam, 1982, p. 87). For example, a “teachable moment” may occur when a person or family member is diagnosed with a health problem that requires a
change in their diet. Wilson (1993) believes that the ability of the adult to think and learn is greatly affected by the availability of tools within the actual context or setting of use. He also states that studying adult problem solving in contexts removed from the actual context does not provide insight into how people think in the real world.

Many adult education planning models advocate for participation by learners in the process of planning programs to enhance their success. Knowles (1980) advises that commitment and motivation for learning is increased when individuals are involved in planning learning activities. The Precede-Proceed model for health promotion planning developed by Green and Kreuter (1999) advocates for input from the grassroots or local level to ensure that there is a link between the program goals and those of the target population. Caffarella (1994) also states that planners should include interested parties whenever possible in the design process to determine priorities, decisions and objectives in an attempt to avoid planning impractical and/or irrelevant programs. Boyle (1981) and Houle (1996) agree with the principle of involving participants in the planning process to ensure that the planner is planning with the people rather than for them.

The Health Belief Model (Strecher & Rosenstock, 1997) has been used to explain change and maintenance of health behaviour and also as a conceptual framework for health behaviour interventions. It is a value expectancy theory with the desire to avoid illness or improve health as the value and the belief that a specific health action will prevent or ameliorate illness as the expectancy. The model is based on the theory that individuals, who believe they are susceptible to a condition that has severe consequences, will take preventive action if they believe the benefits outweigh the costs or barriers of the advised action. The perceived severity includes medical, clinical and social
consequences. The perceived benefits are affected by the person’s opinion of the efficacy of the recommended action to reduce the susceptibility or severity of the health condition. The perceived barriers or potentially negative aspects of a particular health action include the person’s opinion of the tangible and psychological costs of the advised action. Cues that can trigger action include how-to information and awareness campaigns. Self-efficacy or the confidence that the individual has in their ability to take action is also a variable that affects the individual’s actions. Demographic, sociopsychological, and structural variables may influence an individual’s perceptions of factors such as susceptibility, severity, benefits, and barriers, which will in turn have an indirect affect on health-related behaviour.

The Transtheoretical Model which is also known as the Stages of Change Model (Prochaska, Redding, & Evers, 1997) provides the basis for understanding how people move from unhealthy lifestyle habits to healthier ones such as reading the nutrition information on food package labels to make healthy food choices. Behavioural change is viewed as a process of progression through a series of five stages – pre-contemplation, contemplation, preparation, action, and maintenance. The stages represent levels of motivational readiness for behavioural change. In the pre-contemplation stage, people are not considering making any changes to their lifestyle habits in the near future, usually measured as the next six months. People may be in this stage because they are not aware of their susceptibility to health problems or the consequences of inaction. Contemplation is the stage where people are aware of the benefits of changing their behaviour but are also aware of the costs of change. They are thinking about change but are not committed to make the change. People in the preparation stage are making plans to change in the
near future, usually measured as the next month. Consumers who use the nutrition information on labels are in the action or maintenance stage. The characteristics of individuals in the action stage include those that have been making behaviour changes but need continuous effort to maintain this behaviour. Individuals in the maintenance stage, which is one stage higher, have been in the action stage for at least six months. The Model promotes health interventions or education that is tailored to the person’s current stage.

Summary

The finding that 45% of men and 47% of women in Canada rate their eating habits as excellent or very good indicates that there are opportunities for improving the eating habits of the majority of the Canadian population (Federal, Provincial & Territorial Advisory Committee on Population Health, 1999). Ninety percent of Canadians consider nutrition as extremely, very or quite important in choosing food (National Institute of Nutrition, 1999). The nutrition information on food package labels influences the consumers’ ability to choose healthier foods and improve their eating habits. A 1997 Food Marketing Institute survey (Guthrie et al., 1999), a postal survey in New Zealand (Scott & Worsley, 1997), and a survey with Irish consumers (Shine et al., 1997b) found that the nutrition information on food labels did affect consumers’ purchasing decisions. At least 90% of Canadian and New Zealand consumers surveyed want to see the nutrition label on all or most foods (National Institute of Nutrition, 1999; Scott & Worsley, 1997). Canadian consumers surveyed by the Food and Consumer Products Manufacturers of Canada (1996) reported that providing nutrition information on packaged food labels was
one of the two most important priorities they would set for the grocery industry. Food labels were chosen as the most widely used source of nutrition information by consumers surveyed by the National Institute of Nutrition (1997).

Nutrition information on food packages are reportedly used by at least 70% of Canadian and American consumers (National Institute of Nutrition, 1999; Neuhouser et al., 1999). Despite their reported use, in a behavioural test situation (Reid, 1992) and a field study (Cole & Balusubramanian, 1993), the actual use of the nutrition information on food packages by consumers was significantly lower. The mean time spent searching per brand purchased was 12.25 seconds in the study conducted by Moorman (1996). Other studies that investigated the use of nutrition information did not provide the amount of time that the consumer used to complete each assigned task with labels (Levy et al., 1992; Levy & Fein, 1998; Marietta et al., 1999; Miller et al., 1999; National Institute of Nutrition, 1999; Reid, 1992). Studies that are not conducted in the actual context of nutrition information use are not able to capture the complex interactions between other pieces of information that the consumer uses to choose food (Shine et al., 1997b; Wilson, 1993). Studying the use of nutrition information in the actual context of use is important because Reid (1992) found that most consumers do not use the nutrition information on food labels at home. None of the Canadian studies reviewed, investigated the actual rate of use of nutrition information by consumers in a purchase decision context. Research is required to determine the prevalence of use of the nutrition information in making purchase decisions.

It is important to establish realistic goals for consumer use of food package labels. Although the consumers’ ability to place food into the context of a daily diet has been
studied using different label formats, the results have been disappointing (Levy & Fein, 1998; Levy et al., 1992). This may be a task that consumers are not willing and/or able to undertake in a purchase decision context. A greater understanding of how consumers use labels in deciding whether or not to purchase a product is necessary to determine the types of tasks that consumers are willing to undertake. This information is also required to determine the starting point for designing effective education programs (Derby & Fein, 1995). It is also necessary to determine the type of education assistance wanted by consumers to enable them to use the labels for personally relevant tasks (Darkenwald & Merriam, 1982).

A model developed in the United States indicates that nutrition knowledge and overall diet quality are positively correlated (Variyam et al., 1999). There is also evidence that those who consider themselves to be knowledgeable about nutrition use labels more often (Guthrie et al., 1997; Shine et al., 1997a; Health Canada, 2000). The consumers' ability to use the nutrition information on food labels is influenced by their understanding of the information provided. A significant relationship was reported between knowledge about a nutrition term and frequency of use of that nutrient on nutrition labels (Scott & Worsley, 1997). Consumers have difficulties understanding the terminology used on labels (Food and Consumer Product Manufacturers of Canada, 1996; National Institute of Nutrition, 1999; Reid, 1992; Shine et al., 1997b; Wandel, 1997). In the pilot study conducted by Wandel (1997), respondents dealt with this difficulty by using labels to a limited extent or not at all, or focusing on a relatively small part of the label that they were able to understand and use, or using the set of ingredients or contents that they always used. Reported understanding of nutrition information on
food labels was significantly higher than tested knowledge in two Canadian studies (Reid, 1992; National Institute of Nutrition, 1997).

The importance of consumer education related to nutrition information use is exemplified by its inclusion in the vision statement for nutrition labelling in Canada (Health Canada, 1999) and the existence of the National Exchange on Food Labeling Education in the United States. Educational experience with labels was found to be related to increased knowledge and self confidence by Miller et al. (1999) and greater knowledge and increased label use by Marietta et al. (1999). When Shine et al. (1997b) asked whether consumers would be interested in obtaining further information about nutrition, a significant proportion indicated that they would. This lends support to consumers’ interest in nutrition education. However, the web site survey by Health Canada (1999) found that most respondents reported they did not need help with the nutrition label. For those who did request help, they wanted assistance understanding the types of fats and the reference daily intake (% RDI). The Health Canada sample represents a motivated group of respondents who are interested in health and nutrition. Most respondents reported that they are relatively well-informed about nutrition. The Health Canada consultation with stakeholders (1999) identified three main areas of agreement for nutrition information label education; that consumers’ varied needs for information should be considered, that different learning styles should be addressed and that a wide variety of delivery methods are necessary.

Research designed to obtain input on education issues related to nutrition information on labels from the grassroots or local level of Canadian consumers has not been done. As mentioned previously, research is necessary to determine the type of help
consumers want to use this information. Consumers should also be given the opportunity to provide input on who they believe should provide the help and how they think it should be distributed. Involving learners in the process of planning education programs enhances the success of programs (Green & Kreuter, 1999) and is consistent with conventional wisdom among important scholars (Boyle, 1981; Caffarella, 1994; Houle, 1996; Knowles, 1980). The Health Belief Model (Strecher & Rosenstock, 1997) and Stages of Change Model (Prochaska et al., 1997) can be used to help plan education programs that support the use of nutrition information on food package labels.

Health Canada, the Food and Consumer Products Manufacturers of Canada and the National Institute of Nutrition conducted the Canadian labelling research studies reviewed. An independent research study would provide a broader, objective base of evidence related to consumer use of nutrition information on labels and their input on education issues.
CHAPTER THREE
RESEARCH METHODOLOGY

This chapter includes descriptions of the following; research design and the reasons for choosing this design, the research sites, questionnaire development, data collection procedures, pilot study and resulting modifications to the procedure, and steps of data analysis.

Research Design

This study included a descriptive market research component and an exploratory component. The descriptive component involved the observation of consumers while they were shopping in two, large retail grocery stores located in the Greater Vancouver area. The number of consumers who used the nutrition information on food package labels as well as those who did not were counted during each store visit. The exploratory component included both in-store interviews and telephone interviews with consumers observed using the nutrition information label. The purpose of this component was to explore the use of this information, obtain their input on whether they need help to use this part of the label, who they believe should be providing this assistance, and their suggested methods for providing this assistance.

Central location intercept interviews have the advantage of allowing a large number of interviews to be conducted in a short time. This method is often used at the message development stage for programs (Green & Kreuter, 1999). The rate of participation for face-to-face interviews are often around 80% which reduces the problem of volunteer bias (Palys, 1997). The interview technique offers the advantages of
versatility, hearing directly from the consumer, including those consumers who are not literate in English, higher response rates than normally received for non-direct methods, probing for greater understanding, and the opportunity to clarify misunderstandings (Palys, 1997). The unique perspective of the participant can be more fully explored than the focus group method of interviewing where participants may be influenced by other participants (Palys, 1997).

There is the potential for interviewer bias to affect the responses of the consumers interviewed (Russo et al., 1986). This was minimised by the researcher conducting the interviews for the entire study. Also, the interactive nature of the interview technique can create reactive bias on the part of the participant (Palys, 1997). Reactive bias explains the potential for participants to react to verbal and non-verbal cues given by the interviewer, resulting in the participant giving responses that receive positive cues. The researcher was aware of this potential effect on the results and attempted to minimise these cues.

A non-probability sample was used to work within the cost and time constraints of the project. This sampling technique also provides easy access to consumers who use nutrition information on labels and who can provide in-depth information related to label use and input on their education needs. Thirty-eight telephone interviews were conducted until themes and examples were repeated. In most cases, between 30 to 50 interviews are required before examples are repeated (Mertens, 1998).
Questionnaire Development

A short questionnaire was developed for the structured, in-store interview (see Appendix D). The questions were designed to obtain data on the second two research questions related to the parts of the nutrition information on labels used by consumers for their purchase decisions and the types of education assistance wanted by consumers to facilitate their use of this information. Information was collected on the parts of the label consumers use when deciding whether or not to purchase a product, why they use the information, and the assistance needed to use this information effectively. The demographic variables used in this study were similar to the ones used by the National Institute of Nutrition (1997) to allow a comparison with the Canadian national probability sample used by the Institute. The differences were:

- education - high school graduate, some post secondary, and technical college graduate were included as separate items for the present study to allow for greater differentiation between participants;
- occupation – full time and part time items were used to replace the professional/executive, white collar, and blue collar items used by the Institute to more clearly define the options;
- and language spoken at home – Chinese and Punjabi were added to the items to reflect the dominant ethnic languages spoken in the area sampled in the present study.

The time required to complete the questionnaire was limited to five minutes to encourage those with limited time available to participate in the study and to include as many consumers who were using the nutrition information as possible.
A standardized, open-ended questionnaire was used for the telephone interview to provide some flexibility but also provide responses to the same basic questions (see Appendix E). The researcher can make a truer assessment of the types of educational assistance consumers want using open-ended questions rather than close-ended questions (Cohen & Manion, 1994). The questionnaire was designed to confirm responses collected during the in-store interview (excluding the demographic information), obtain more in-depth information about the types of education assistance wanted by participants, and collect information on the research questions related to who should provide education information and how it should be distributed. Participants were told that saturated fat, trans fat, calcium, and iron may be added to the core list of nutrients on the nutrition label. This question was asked to determine the awareness of the relationship between these nutrients and health. Fibre and sodium may also be added to the core list but were not included in the questionnaire because consumer survey research has shown a higher awareness of disease relationships for these nutrients (Derby & Fein, 1995). The questions were limited to four nutrients to limit the time required by participants for the interview. Confirmation of answers from the in-store interview ensured that the point form notes taken were accurate.

**Research Sites**

The research sites included two large retail grocery stores in the Greater Vancouver area, one in North Vancouver and one in Surrey. The North Vancouver site was larger with a store size of approximately 60,000 square feet, it provided a larger selection of products, and had a larger sales volume than the Surrey site. The Surrey site
was approximately 35,000 square feet. Standard grocery items were available as well as pharmacy, cosmetic, photography, and flower departments. The store layouts were similar in both locations. The fruits and vegetables, dairy, bakery, meat, poultry and fish sections were located around the perimeter of the store. The packaged food aisles ran parallel to each other in the central area of the store.

The two sites were chosen because they would provide responses from both higher and lower socio-economic consumers. The statistical profile for the District of North Vancouver shows higher incomes, higher levels of schooling, lower unemployment rates, a lower proportion of other languages understood, and a lower proportion of visible minority characteristics and languages than the City of Surrey (Statistics Canada, 2000).

The researcher and research assistant stood apart in the dairy section at the end of different packaged food aisles. This allowed the observation of consumers in both the dairy section and two separate aisles. The dairy section was chosen because of the high volume of consumer traffic and the large number of products with nutrition labels and nutrition claims. Permission to collect data from their customers was received in writing from both the regional manager and store managers.

Procedure

Each location was visited on a Thursday and Friday afternoon from 1 to 5 p.m. because these are the most popular days and times for main grocery trips (Food and Consumer Products Manufacturers of Canada, 1996). Each store was also visited on Thursday evening from 6 to 10 p.m. to include those individuals who work standard, full-
time hours. Days that follow normal pay periods as well as days one week after this period were chosen to capture main grocery trips.

A research assistant was hired to count the number of consumers who use the nutrition information labels on food package labels to help with their purchasing decision. The research assistant counted the number of consumers who appeared to be 18 years and older and who appeared to read the nutrition information on food labels before placing them in their shopping cart or basket. She also counted the number of consumers who placed a product in their cart or basket without reading the nutrition information on the label. Consumers who walked down the aisle and did not pick up a product were not counted to avoid counting those consumers who were only browsing. The counting was done with two small tally counters in separate pockets of the research assistant’s blazer to avoid affecting consumers’ shopping behaviours. Each time a button was pushed on the tally counter, a number was added to the total.

The research assistant was trained to avoid counting those who were using parts of the label other than the nutrition information. For example, if the consumer was looking at the labels from two identical products, it was assumed that the consumer was using the expiry date portion of the label. There is the potential of counting consumers as nutrition information users when they are not using this part of the label. This was minimised by the researcher approaching consumers who were assumed to be using the nutrition information and asking if they were using this part of the label before proceeding with the in-store interview. If they were not using the nutrition information, they were subtracted from the tally counter used to count the number of consumers using the nutrition information. The number of consumers counted as nutrition information
users who were not interviewed because the researcher was interviewing another consumer could also be determined from the count obtained for each store visit. Utilising more researchers could decrease the number of nutrition information users omitted from the in-store interviews. However, more than two researchers present at one time may be too obtrusive and affect consumers' regular shopping habits. This weakness was minimised by ensuring that the interviews were limited to five minutes.

Consumers confirmed to be reading the nutrition information were asked if they would be willing to take part in a 5 minute interview. If they agreed, they were also asked if they would be willing to take part in an additional 15 to 20 minute, taped telephone interview. Each participant read and signed the first page of the consent form (see Appendix F) and received a copy of the form before the interview began. Participants who agreed to the telephone interview were asked to read and also sign the informed consent form addendum. The participant was asked to place one or more checks in a table at the end of the consent form for the best time and day to call for the interview. Telephone participants received a copy of the questionnaire to be used for this part of the study. Each participant was told they would receive two dollars at the end of the interview to encourage involvement in the study and therefore increase the response rate (Mertens, 1998). They were also informed that copies of the abstract would be mailed to interested participants. The in-store questionnaire was shown to the consumer as the researcher filled in the questions. Check marks were placed in the appropriate places on the questionnaire and point form notes were used to record responses to open-ended questions. When the interview was finished, the next person who appeared to be reading the nutrition information was approached for an interview.
The researcher attempted to conduct the telephone interview within one week of the in-store interview so those consumers would be more likely to remember the research project. The interviews were conducted in an informal, conversational manner and the questions were asked in the order shown on the telephone questionnaire but the precise wording varied depending on the participant's understanding of the question or based on issues raised by the participant. In some cases the answers to the first two questions from the telephone interview were different than those recorded in the in-store interview because the participant added more detail or they added other parts of the label that they use. Probing questions were asked when appropriate to encourage participants to provide more detail. Interviews averaged about 15 minutes in length, ranging from about 7 to 25 minutes long. All interviews were audio tape-recorded and verbatim transcripts were prepared. This was done to enhance the accuracy and reliability of the data (Cohen & Manion, 1994). Anonymity for each participant was provided by coding both the in-store interviews and taped interviews with a number so that they were recognizable only to the researcher.

**Pilot Study and Modifications**

For the pilot study, the North Vancouver site was visited on a Thursday from 1 to 4 p.m. The researcher and research assistant stood in the dairy section from 1 to 2 p.m. and in the cereal aisle from 2 to 3 p.m. The research assistant counted the number of consumers who appeared to be 18 years and older and who appeared to read the nutrition information on food labels before placing them in their shopping cart or basket. Consumers who did not pick up a product were not counted. A total of 126 consumers
were observed in the dairy section and 19 of them were using the nutrition information. A total of 51 consumers were counted in the cereal aisle and 2 of them were using the nutrition information. The study design was modified for the last hour and for future visits to compensate for the low number of interviews, which occurred in the cereal aisle. The dairy section was located along the back of the store. Packaged food aisles ran parallel to each other and met the dairy section at right angles. The researcher stood at the end of the cereal aisle in the dairy section and the research assistant stood at the end of another packaged food aisle in the dairy section to allow the researchers to observe consumers in two separate aisles as well as the dairy section.

The nutrition information used section of the in-store questionnaire was modified after the pilot test to include the types of fats, including polyunsaturated, monounsaturated, saturated and trans, which may appear on a label. At the end of the in-store interview, participants were asked if they would be willing to take part in an additional telephone interview. If they agreed, they were asked to sign an additional consent form. Asking consumers before the in-store interview began if they would like to participate in an additional telephone interview modified this procedure. If they agreed, they signed an addendum to the in-store interview at the same time. This reduced the amount of reading required by telephone participants. The wording of the telephone questionnaire was modified slightly to make the questions easier for participants to understand. In future store visits, consumers were given a copy of the telephone questionnaire to give them the opportunity of reading the questions before the interview. If they chose to do so, it gave them more time to consider their responses to the questions. The results from the 16 participants who participated in the pilot study were
included in the overall results because the study design was only slightly modified after
the pilot test.

Analysis

In-store questionnaires were tallied on a summary sheet for each store visit. The
answers to open-ended questions were also compiled together on a summary list for each
store. Similar answers to open-ended questions were grouped together into common
groups or themes. The types of food that consumers use nutrition information labels to
help with their purchasing decisions were grouped together into the milk products and
grain products groups and the other foods category from Canada’s Food Guide to Healthy
Eating. Examples of foods that fit into the other foods category include jams, salad
dressings, margarine, and oils. Canned products and frozen food categories were also
used. Demographic profile answers were checked to ensure that category totals added up
to the total number of participants (87) with the exception of language spoken at home
and family composition categories where participants could choose more than one
answer. Each summary sheet was checked twice before entering the results on a master
summary list for the seven store visits. There were some revisions to the summary sheets
after the telephone interviews because of additions to parts of the label used and some
participants changed their answer to yes for help needed with the label after proposed
changes to the label were explained. A revised master summary sheet was prepared for
the seven store visits.

The Atlas.ti computer software program for qualitative analysis (Scientific
Software Development, Version 4.1, 1997, Berlin) was used to aid in coding, analyzing,
and interpreting the open-ended questions. The Atlas.ti program was chosen because it is recognized as one of the best examples of qualitative analysis software suited to a range of analytic approaches (Punch, 1998). The program facilitated a systematic, disciplined approach to the analysis. Each transcribed interview was entered into the program as a numbered, primary document. Quotations within each document were selected and linked with codes. Codes or meaning units, which were one or two words, served as classification devices to group related pieces of information or quotations for analysis purposes. The program allows the codes to be viewed in a margin area beside the quotations in each primary document. Memos could be attached to codes to explain codes in greater detail. Each code could be selected from a master list of codes to display the quotations linked to the code. Selecting the quotation from this list took the researcher to the primary document from which the quotation was initially recorded. This allowed the researcher to review the number and type of quotations attached to each code relatively quickly and easily. Summaries of quotations from each document and summaries of codes and quotations linked to that code could be viewed and printed. Each quotation was shown with a primary document number and line number attached for easy reviewing.

Each interview was listened to and then read before using the Atlas.ti program for analysis. Codes were created to reflect the main topics of interest. These areas of interest included the types of foods for which consumers use the nutrition information on labels to help with their purchasing decision, reasons why they use the portions of the label that they read, how they learned to use the nutrition information labels, whether they need help to use the existing or proposed additions to the label, who should be providing the
education, and what methods should be used to distribute the education information. A second stage of coding involved examining each main code and tagging segments with more specific code labels. For example, under the code of provider of education were five types of providers including government and health professionals. Each interview was checked two more times to ensure that the coding was applied consistently to each interview.

Summary

This chapter outlined the method of inquiry used for this study as well as the reasons for choosing this design. The development of the questionnaire, a description of the research sites, the procedure, and the pilot study and resulting modifications to the design were discussed. The steps taken to analyze the data were also described.
CHAPTER FOUR
FINDINGS

This chapter presents the results of the study under the following headings; consumer use of nutrition information, nutrition information used, who should provide the education assistance, methods for providing education to consumers, reasons for use, and a summary of the main findings related to the research questions. Verbatim responses from telephone participants are provided in this chapter to allow the reader to gain a greater understanding of the participants’ perspective. Ellipses (...) indicate that several words have been omitted.

Consumer Use of Nutrition Information

During the seven store visits, 2,316 consumers were observed choosing products from the dairy section or packaged food aisles of the grocery stores. Seven percent (157) of these consumers were observed using the nutrition information on food package labels. The following quotes help to explain the low observed rate of nutrition information use.

"I look at something and then I buy it from habit. Every time I shop I don’t look at things, but I do for a new product, especially if it is convenience food. Something that is supposed to be easy and quick, I always look at the labels.”

Code 80, female, North Vancouver, April 6

“...if I was really busy, I might have a tendency to go with what is familiar, and worry about it afterwards.”

Code 51, female, Surrey, March 23
One percent (28) of consumers initially identified as nutrition information label users were reading other parts of the label. In most cases this was the expiry date portion of the label. These consumers were subtracted from the tally counter used to count the number of label readers. There will be some consumers counted as label readers who may not have been using the nutrition information part of the label. This will slightly increase the reported usage of nutrition information labels. Twenty-two percent (34) of consumers approached to be interviewed refused because of a lack of time or interest. This is a typical participation rate for face-to-face interviews (Palys, 1997). Forty-five percent (70) of consumers using nutrition information labels were not interviewed because the researcher was interviewing another consumer. Forty-four percent (38) of the participants interviewed in the store agreed to participate in the additional telephone interview. Originally, four additional in-store participants agreed to a telephone interview but they could not be reached after six attempts to contact them by telephone.

Table 1 provides a breakdown of the number and percentage of consumers observed and the number interviewed both in the store and over the telephone from the two research sites. Thursday evening from 6 to 10 p.m. had the lowest volume of consumers at both stores. An average of 8% (109) of the customers in the North Vancouver store and 5% (48) in the Surrey store were observed reading the nutrition information on food package labels. Sixty-eight percent (59) of the in-store interviews and 71% (28) of the telephone interviews were conducted with participants from the North Vancouver store.
Table 1. Consumers Observed and Interviewed for Each Store Visit

<table>
<thead>
<tr>
<th>Date and time</th>
<th>Observed Read label</th>
<th>Observed Didn’t read label</th>
<th>In-store interview</th>
<th>Telephone interview</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>North Vancouver</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thursday, February 24,</td>
<td>29 (9%)</td>
<td>279 (91%)</td>
<td>16</td>
<td>9</td>
</tr>
<tr>
<td>1-4 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thursday, March 16,</td>
<td>22 (7%)</td>
<td>277 (93%)</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td>6-10 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friday, March 24,</td>
<td>31 (7%)</td>
<td>388 (93%)</td>
<td>17</td>
<td>7</td>
</tr>
<tr>
<td>1-5 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thursday, April 6,</td>
<td>27 (8%)</td>
<td>329 (92%)</td>
<td>13</td>
<td>5</td>
</tr>
<tr>
<td>1-5 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub total</td>
<td>109 (8%)</td>
<td>1273 (92%)</td>
<td>59</td>
<td>27</td>
</tr>
<tr>
<td><strong>Surrey</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friday, March 17,</td>
<td>24 (7%)</td>
<td>304 (93%)</td>
<td>13</td>
<td>3</td>
</tr>
<tr>
<td>1-5 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thursday, March 23,</td>
<td>18 (5%)</td>
<td>315 (95%)</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>1-5 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thursday, March 30,</td>
<td>6 (2%)</td>
<td>267 (98%)</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>6-10 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub total</td>
<td>48 (5%)</td>
<td>886 (95%)</td>
<td>28</td>
<td>11</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>157 (7%)</td>
<td>2,159 (93%)</td>
<td>87</td>
<td>38</td>
</tr>
</tbody>
</table>

*Read nutrition information on label

The use of the nutrition information on food labels by study participants completing the interview was extensive. Fifty-six percent (49) of the in-store interview participants used the nutrition information on all food products that supplied these labels. Forty-four percent (38) used the nutrition information for foods from the milk products group, 14% (12) for foods from the grain products group, 10% (9) for canned products, 9% (8) for foods from the other foods category, and 3% (3) for frozen foods. Examples of foods from the other food category include candy, jam, and oil.
There were differences in the demographic profiles for the participants from the North Vancouver and Surrey sites as shown in Table 2. As expected, the income and education levels were higher for North Vancouver and there were more people who spoke other languages in Surrey. The North Vancouver sample had a higher percentage of female participants and the Surrey sample had a higher percentage of male participants. The household size was greater in Surrey. The age groups differed between the two samples. Almost half of the participants from the North Vancouver location were in the 55 years of age or over category.

**Nutrition Information Used**

Table 3 shows the percentage of in-store participants who reported using different parts of the nutrition information label. The use of the types of fat including, polyunsaturated, monounsaturated, saturated and trans fat, will be slightly underestimated because these terms were not included in the pilot study with 16 participants. The results from the pilot study have been incorporated into the overall results. The top four parts of the label reportedly used were fat, the ingredient list, nutrition claims, and calories. Of the 80% (70) of participants who reported using the ingredient list, 40% (35) indicated that they used the list primarily for limiting additives, fat, and sugar and 7% (6) reported that they were looking for natural ingredients. Of the 62% (54) who reported using the nutrition claims portion of the label, 9% (8) of participants reported using them in conjunction with the ingredient list or the nutrition label to validate the claim.
### Table 2. Demographic Profiles for In-store Participants from the North Vancouver and Surrey Locations

<table>
<thead>
<tr>
<th>Category</th>
<th>Item</th>
<th>% North Vancouver (n=59)</th>
<th>% Surrey (n=28)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>15</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>85</td>
<td>64</td>
</tr>
<tr>
<td>Age</td>
<td>18-34 years</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>35-54 years</td>
<td>39</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>≥55 years</td>
<td>49</td>
<td>32</td>
</tr>
<tr>
<td>Marital status</td>
<td>Single</td>
<td>22</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Married/common-law</td>
<td>59</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>Widowed/divorced/separated</td>
<td>19</td>
<td>11</td>
</tr>
<tr>
<td>Education</td>
<td>Elementary</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Some secondary</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>High school graduate</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Some post secondary</td>
<td>22</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Technical college graduate</td>
<td>14</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>University graduate</td>
<td>37</td>
<td>21</td>
</tr>
<tr>
<td>Household income</td>
<td>&lt;$25,000</td>
<td>12</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>$25,000-$49,999</td>
<td>29</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>&gt;$50,000</td>
<td>59</td>
<td>21</td>
</tr>
<tr>
<td>Working status</td>
<td>Full time</td>
<td>36</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>Part time</td>
<td>22</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Retired</td>
<td>25</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Homemaker</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Other (student/unemployed)</td>
<td>8</td>
<td>11</td>
</tr>
<tr>
<td>Language spoken at home</td>
<td>English</td>
<td>92</td>
<td>86</td>
</tr>
<tr>
<td></td>
<td>French</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Punjabi</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Chinese</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>Household size</td>
<td>One</td>
<td>17</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Two</td>
<td>51</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>&gt;Three</td>
<td>32</td>
<td>47</td>
</tr>
<tr>
<td>Family composition</td>
<td>Adults only</td>
<td>75</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>Children &lt;18 years</td>
<td>22</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>Children &lt;5 years</td>
<td>17</td>
<td>4</td>
</tr>
</tbody>
</table>

* Participants could choose more than one response in these categories
Table 3. Nutrition Information Used by In-store Participants

<table>
<thead>
<tr>
<th>Nutrition information used</th>
<th>% of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n=87)</td>
</tr>
<tr>
<td>Fat</td>
<td>84</td>
</tr>
<tr>
<td>Ingredient list</td>
<td>80</td>
</tr>
<tr>
<td>Nutrition claim</td>
<td>62</td>
</tr>
<tr>
<td>Energy/calories</td>
<td>57</td>
</tr>
<tr>
<td>Sugars</td>
<td>53</td>
</tr>
<tr>
<td>Protein</td>
<td>49</td>
</tr>
<tr>
<td>Fibre</td>
<td>47</td>
</tr>
<tr>
<td>Carbohydrate</td>
<td>46</td>
</tr>
<tr>
<td>Sodium, saturated fat</td>
<td>45</td>
</tr>
<tr>
<td>Polyunsaturated fat, monounsaturated fat, vitamins, cholesterol</td>
<td>40</td>
</tr>
<tr>
<td>Minerals</td>
<td>39</td>
</tr>
<tr>
<td>Trans fat, potassium</td>
<td>38</td>
</tr>
<tr>
<td>Serving size</td>
<td>28</td>
</tr>
<tr>
<td>Starch</td>
<td>25</td>
</tr>
</tbody>
</table>

Telephone participants were asked why they didn’t use some parts of the nutrition information label. Forty-two percent (16) of participants replied that they weren’t concerned with those nutrients and their health and 21% (8) replied that they didn’t understand how to use that part of the label.

“There is no reason not to, just I am not overly concerned about them.”

Code 1, female, North Vancouver, February 24

“I do not really know about the vitamins. There is a million different people telling me you need this much D and this much A, so I do not usually look at them. I have no education on this.”

Code 38, female, Surrey, March 17
Eleven percent (4) of telephone interview participants mentioned that they didn’t use the labels for nutrients perceived to be positive, including fibre, vitamins, and minerals because they relied on fresh foods without labels, such as fruits and vegetables, or vitamin and/or mineral supplements for these nutrients.

“Probably because when it comes to vitamins and minerals in products that are labelled, I look for those things in fresh fruits, vegetables, vitamin pills, and those kinds of things.”

Code 81, female, North Vancouver, April 6

There was a great deal of confusion with the term, serving size, when this was discussed with participants. Most of the participants believed that this term was used to describe a suggested serving size rather than identifying the quantity of food used for declaring the nutrient content. This part of the label had one of the lowest rates of use.

“I don’t pay attention to how many people they say it feeds.”

Code 51, female, Surrey, March 23

**Reasons For Use**

Table 4 provides the reported reasons for using nutrition information, broken down into categories based on participants’ responses to an open-ended question on reasons for use.
Table 4: Reported Reasons for Using Nutrition Information by In-store Participants

<table>
<thead>
<tr>
<th>Reason</th>
<th>% of Participants (n=87)</th>
</tr>
</thead>
<tbody>
<tr>
<td>To limit nutrients perceived to be harmful (fat, calories, sugar, additives, salt)</td>
<td>48</td>
</tr>
<tr>
<td>To determine if a product is a healthy choice</td>
<td>44</td>
</tr>
<tr>
<td>To plan for a special diet for a health reason</td>
<td>34</td>
</tr>
<tr>
<td>To limit artificial ingredients/additives</td>
<td>29</td>
</tr>
<tr>
<td>To determine contents</td>
<td>25</td>
</tr>
<tr>
<td>To increase nutrients perceived to be beneficial (fibre, vitamins, minerals)</td>
<td>9</td>
</tr>
<tr>
<td>To compare foods</td>
<td>5</td>
</tr>
<tr>
<td>To decide on buying a new product</td>
<td>3</td>
</tr>
</tbody>
</table>

Participants tended to use the labels primarily for limiting nutrients perceived to be harmful including fat, calories, sugar, salt, and additives.

“I am looking to, you know, to determine what I am using isn’t something that I really don’t want to be putting into myself, like you know, a lot of extra fats and extra sugars and extra salt and some of the other less desirable things like MSG.”

Code 60, female, North Vancouver, March 24

“Whenever I buy a product for the first time, if it is something my kids are going to eat then I check the label for like how much sugar and salt and whether it has got hydrogenised oils on it and that kind of thing, depending on how you know, worried I am about it at that particular time.”

Code 16, female, North Vancouver, February 24

“Well one thing I really want to know is how many chemicals are in them, because if I see a really long list of chemicals, I put it right back.”

Code 71, female, Surrey, March 30
Forty-four percent (17) of the 38 participants contacted by telephone used the nutrition information on food packages to help plan their overall diets. For the remaining participants who don’t use the label for this purpose, the majority (86%, 18) did not want help in this area.

Need for Education Assistance

Fourteen percent (12) of the in-store participants initially responded that they needed help to use the nutrition information on the label. Originally, 13% (5) of the telephone participants wanted help to use the nutrition information on the label. Proposed changes by Health Canada to the nutrition label include the additions of saturated fat, trans fat, calcium, and iron to the core list or list of nutrients that are given every time nutrition labelling appears. When this was explained to telephone participants and they were asked again whether they needed help to use either the existing or the proposed additions to the nutrition information label, 34% (13) changed their response to yes. This meant that 47% (18) of the 38 telephone participants wanted help and 29% (25) of the overall participants (87) interviewed wanted help. Although 24% (9) of the telephone participants did not understand some of the terms that will be included with the expanded core list, they were not interested in any help to understand these terms.

When the 25 responses to the open-ended question on the need for help from both the in-store and telephone participants were analyzed, 68% (17) wanted the education directed towards the types of fats. The second most popular response was for help understanding the terms used on the label (24%, 6), that includes terms used in the ingredient list, nutrition claims, and the nutrition label. Sixteen percent (4) of participants
wanted general information for a healthy diet. Sixteen percent (4) of participants requested help with the % of Recommended Daily Intake portion of the nutrition label.

"Yeah, I think for analyzing it properly I probably don't know enough about it and I may not even, you know, be assessing it properly."

Code 4, female, North Vancouver, February 24

“Yes, I would like more information, as far as what percentage and actually the percentage is probably the most helpful thing they can give, because to tell me I am consuming 5 grams of fibre, you know, doesn't mean a lot.”

Code 17, female, North Vancouver, March 16

“I have some concerns about light and reduced. Light product, people think it must be healthy, low fat, but a very, very high fat product can be very slightly reduced and they call it light or it can be a lighter texture or flavour. I think the term light and some of those words that people think means it’s healthy can be very misleading.”

Code 80, female, North Vancouver, April 6

All of the telephone participants understood the relationship between calcium and nutritional health and 95% reportedly understood the relationship between iron and nutritional health. However, it was apparent from the comments from some of the participants, that their understanding of iron was contrary to the beliefs of most health professionals. Eighteen percent (7) of the telephone participants expressed concern about obtaining too much iron from their diet. The following quote is from a participant who was reading the label on a dairy product to find a product without iron.
"...but iron, we are getting too much of it and we can be overdosing on it from what I have read, so now we are looking for vitamins that don’t contain iron in them because we get sufficient amounts. Otherwise, what the body does, is it retains it and you can get iron toxicity."

Code 47, female, Surrey, March 23

Sixty-three percent and 50% of the telephone participants reported they understood the terms saturated and trans fat, respectively and their relationship to nutritional health. The discussion with those who reported an understanding indicated some confusion with these terms.

"Well the fats I get mixed up on all the time. So the types of fat, I know them one day and then the next day I think, what was that again?"

Code 6, female, North Vancouver, February 24

When telephone participants were asked how they learned to use labels, 63% (24) responded by saying that they had learned on their own. Books (26%, 10), television (24%, 9), magazines (24%, 9), newspapers (18%, 7), formal education (16%, 6), health professionals (16%, 6), Weight Watchers (8%, 3), friends (8%, 3), family (8%, 3), recipes (5%, 2), radio (3%, 1), and the internet (3%, 1) were also reported as sources of education.
Who Should Provide the Education Assistance

Fifty percent of telephone participants stated that the companies who produce the food products should provide the education assistance to facilitate their use of the nutrition information on food package labels. This was followed in the number of responses by the government (37%, 14), health professionals (34%, 13), grocery stores (16%, 6), and schools (8%, 3). After consumers provided their thoughts on who should provide the education assistance, they were asked why they thought the provider should do this. Eighty-six percent of participants believed that the providers they mentioned should provide the education because of a responsibility to do so. Some of these consumers stated that it is the responsibility of the government to provide the assistance as a preventative health measure.

“Well because the government receives all these taxes from the whole population to take care of a few things and that should be one of those things to maintain the health of the nation.”

Code 54, male, North Vancouver, March 24

Twenty-four percent chose health professionals because of their knowledge and their ability to provide unbiased approaches to education.
“They hopefully know what they are talking about. They would be probably the most likely, especially if they are independent of the manufacturer, be the most likely to separate good information from the faddish information. There’s a lot of food faddism out there.”

Code 27, female, North Vancouver, March 16

Thirty-nine percent of participants mentioned some degree of mistrust with food companies providing the education assistance because of their bias towards their products.

“I really don’t know who should be providing us with the information because I mean food being such a competitive thing between manufacturers, I mean surely all they are going to do is you know advertise their own particular products.”

Code 55, male, North Vancouver, March 24

**Methods for Providing Education to Consumers**

Telephone participants provided unaided suggestions on how the education information should be distributed or provided to consumers. Providing handouts in the grocery stores (22, 58%) was the most popular suggestion followed by; television (14, 37%), incorporating it into the curriculum of public schools (8, 21%), newspapers (7, 18%), magazines (6, 16%), internet (6, 16%), direct mail handouts (6, 16%), handouts in health offices (4, 11%), radio (4, 11%), on food packages (3, 8%), presentations to seniors’ groups (3, 8%), small signs by the foods in grocery stores (3, 8%), videos (2,
5%), displays in grocery stores (2, 5%), grocery store tours by a dietitian or nutritionist (1, 3%), night school classes (1, 3%), posters in grocery stores (1, 3%), prenatal nutrition classes (1, 3%), handouts in libraries (1, 3%), handouts in drug stores (1, 3%), separate labels for different age groups and sexes (1, 3%), signs on the back of washroom doors (1, 3%), displays in community centres (1, 3%), displays in fitness centres (1, 3%), and government bulletins (1, 3%).

Following this, telephone participants were asked whether they agreed or disagreed with suggestions provided by the researcher for distributing educational support to consumers. The number agreeing with the researcher’s suggestions were added to the unaided suggestions of participants to determine the most popular choices. The following list is given in order of popularity; providing handouts at grocery stores in holders close to the foods (34, 90%), newspapers (29, 88%), handouts in health offices (33, 87%), internet (33, 87%), incorporating it into the curriculum of public schools (33, 87%), radio (28, 85%), health fair displays (32, 84%), toll free number for information (31, 82%), magazines (31, 82%), grocery store tours by a dietitian or nutritionist (31, 82%), television (31, 82%), night school classes (29, 76%), displays in grocery stores (28, 74%), posters in grocery stores (27, 71%), and direct mail handouts (21, 55%).

Summary

Seven percent (157) participants were observed using the nutrition information on food package labels. The top four parts of the labels used were fat (84%), the ingredient list (75%), nutrition claims (62%), and energy or calories (57%). Thirteen percent (5) of the telephone participants initially responded they needed help to use the nutrition
information on the label. When proposed changes to the nutrition label by Health Canada were explained to telephone participants and they were asked again if they needed help, 13 participants changed their answer to yes. This meant that 47% of the telephone participants requested assistance to use the nutrition information on the label. For those who requested assistance, 68% (17) wanted help with the types of fats that may be included on labels, 24% (6) wanted help with the terms used on the label, 16% (4) requested general information for a healthy diet, and 16% (4) wanted help understanding the % of Recommended Daily Intake (% RDI) portion of the nutrition label. Telephone participants thought that food companies (50%, 19), followed by government (37%, 14), health professionals (34%, 13), grocery stores (16%, 6), and schools (8%, 3) should provide the education assistance to help consumers use the nutrition information on food package labels. The top three unaided responses to the question of how the education information should be distributed to consumers were providing handouts in grocery stores (58%), television (37%), and incorporating it into the curriculum of schools (21%). The top five choices when the aided and unaided responses were added together were providing handouts at grocery stores in holders close to the foods (90%), newspapers (88%), handouts in health offices (87%), internet (87%), and incorporating it into the curriculum of public schools (87%).
CHAPTER FIVE
DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

This final chapter begins with a discussion, which includes an explanation of the findings through a comparison to the literature reviewed in chapter two and the limitations of this study. It is followed by conclusions and recommendations for further research, for policy makers, and for education providers.

Discussion

Consumer Use of Nutrition Information

This study found that 7% (157) from a total of 2,316 consumers used the nutrition information on food package labels. This contrasts to findings from a National Institute of Nutrition (1999) study which reported that 70% of Canadian consumers claim they use the nutrition label often or sometimes, 71% indicate that the nutrition related information on package labels is at least quite an important factor in their food choices, and 90% report that they consider nutrition as extremely, very or quite important in choosing food. Cole and Balasubramanian (1993) reported that only 5% of consumers observed choosing cereals in the cereal aisle of a grocery store used the nutrition information label. In a behavioural test situation, Reid (1992) found that only 25% of participants used the nutrition information for choosing foods. The low rate of use of nutrition information on labels found in this study could be due to consumers using other factors such as taste, cost, convenience, brand, or quality for their purchasing decision. Quality was ranked above nutrition when Irish consumers were asked to rank food product attributes (Shine
et al., 1997b). The low rate of use could also be due in part to consumers purchasing familiar foods for which they have previously read the labels.

The consumers observed in this study were primarily in the dairy section of two grocery stores. Because dairy products are frequently purchased food items, it is likely that consumers do not read the nutrition information on these products every time they purchase them. The rate of use of nutrition labels would also be affected by the availability of nutrition information on food packages. All packaged foods must have an ingredient list on the label. Most of the foods in the dairy section had nutrition labels. There were two types of specialty eggs that provided nutrition labels but the remaining types of eggs did not provide this information. Eggs are purchased relatively frequently, which would affect the observed rate of use of nutrition information. Also, reported use may be higher than actual use due to social desirability bias, which results in participants providing the response that they believe is the socially correct response (Guthrie et al., 1995).

Over 90% of Canadian (National Institute of Nutrition, 1999) and New Zealand (Scott & Worsley, 1997) study participants reported that they would like to see nutrition information on all or most foods. Canadian consumers surveyed by the Food and Consumer Products Manufacturers of Canada (1996) reported that providing nutrition information on packaged food labels was one of their top two priorities for the grocery industry. The availability of nutrition information on food package labels may reflect a fundamental democratic value of the right to know this information.

A comparison of the demographic profile of study participants and the national probability sample from the National Institute of Nutrition (1997) study is provided in
Table 5. In general, label users in the present study differ from the Canadian demographics sample used by the Institute in the following ways: they tend to be female, over the age of 55, with higher education and income, retired, English speaking, and with two adults in the household. The high percentage of women reading labels can be explained by the fact that 85% of main grocery shoppers are women (Food and Consumer Products Manufacturers of Canada, 1996) and women tend to be more interested in nutrition than men (National Institute of Nutrition, 1997). Both the National Institute of Nutrition (1998) and Guthrie et al. (1995) found that more women with higher education and income report using nutrition information labels. A study in Ireland (Shine et al., 1997b) also found that label readers tend to be women with higher levels of education. This study had more label readers in the over 55 age category (44%) than the other two age categories (41%, 15%). This differs from the National Institute of Nutrition (1998) and Guthrie et al. (1995) findings that reported greater use of labels in the under age 55 group. It is also higher than the National Institute of Nutrition (1998) probability sample size of 27% for this age category. This may be attributed to a greater number of shoppers in this age category at the two stores visited, or the fact that 58% of participants from this age category use the nutrition information labels to plan for a health related diet, or this age group may have more time available to read labels.
Table 5. Demographic Profile of Study Participants Compared to the National Institute of Nutrition (1997) Study

<table>
<thead>
<tr>
<th>Category</th>
<th>Item</th>
<th>% Study (n=87)</th>
<th>% National Institute of Nutrition (n=1,956)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>21</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>79</td>
<td>51</td>
</tr>
<tr>
<td>Age</td>
<td>18-34 years</td>
<td>15</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>35-54 years</td>
<td>41</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>≥55 years</td>
<td>44</td>
<td>27</td>
</tr>
<tr>
<td>Marital status</td>
<td>Single</td>
<td>24</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Married/common-law</td>
<td>60</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>Widowed/divorced/separated</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Education</td>
<td>Elementary</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Some secondary</td>
<td>5</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>High school graduate</td>
<td>26</td>
<td>46*</td>
</tr>
<tr>
<td></td>
<td>Some post secondary</td>
<td>22</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Technical college graduate</td>
<td>15</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>University graduate</td>
<td>32</td>
<td>25</td>
</tr>
<tr>
<td>Household income</td>
<td>&lt;$25,000</td>
<td>17</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>$25,000-$49,999</td>
<td>36</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>≥$50,000</td>
<td>47</td>
<td>36</td>
</tr>
<tr>
<td>Working status</td>
<td>Full time</td>
<td>37</td>
<td>55*</td>
</tr>
<tr>
<td></td>
<td>Part time</td>
<td>18</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Retired</td>
<td>28</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Homemaker</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Other (student/unemployed)</td>
<td>9</td>
<td>14</td>
</tr>
<tr>
<td>Language spoken at home</td>
<td>English</td>
<td>90</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>French</td>
<td>1</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>Punjabi</td>
<td>0</td>
<td>-- a</td>
</tr>
<tr>
<td></td>
<td>Chinese</td>
<td>1</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>11</td>
<td>8*</td>
</tr>
<tr>
<td>Household size</td>
<td>One</td>
<td>16</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Two</td>
<td>47</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>≥Three</td>
<td>37</td>
<td>58</td>
</tr>
<tr>
<td>Family composition</td>
<td>Adults only</td>
<td>72</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Children &lt;18 years</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Children &lt;5 years</td>
<td>9</td>
<td>15</td>
</tr>
</tbody>
</table>

Note. Some categories were divided into more items in the present study than the Institute sample. As a result, those numbers with an asterisk from the Institute column must be added together to allow for comparison with the present study. For example, in the working status category, the full and part time item numbers would be added together (37+18=55) to compare with the full and part time item (55) grouping from the Institute column.

a Dashes indicate data was not obtained.
b Participants could choose more than one response in these categories.
The National Institute of Nutrition (1999) study found a higher reported use of nutrition labels for participants with diabetes but those with heart disease reported similar usage levels as the overall sample. The higher reported use for diabetics may be due in part to the availability of Canadian Diabetes Association Food Choice Values on some food package labels. Kreuter et al. (1997) reported that patients with hypertension or elevated cholesterol were more likely to read the sodium and fat information on labels, respectively, which are recommended dietary modifications for these health problems. They were not more likely to be reading other parts of the label. The study by Neuhouser et al. (1999) did not find a statistically significant relationship between label use and persons with diseases, which often include dietary modifications, when adjustments were made for demographic variables. Consumers who use the nutrition information labels for a health related diet might use the parts of the label related to their health problem more frequently for helping with their purchase decisions. A study that observes label reading in the context of use would capture those who use the label more frequently. Levy and Fein (1998) found that those with a diet-related health condition performed poorer on assigned nutrition label tasks. Although reports indicate that men make up 15% of primary grocery shoppers (Food and Consumer Products Manufacturers of Canada, 1996) and they are not as interested in nutrition as women (National Institute of Nutrition, 1999), 21% of the participants in this study were male. This percentage may be higher than expected due to a larger number of male shoppers at the two stores visited or the fact that 55% of the males from this study were in the over 55 age category and 80% of these participants were using the labels to plan for a health related diet.
Derby and Fein (1995) state that one of the necessary starting points for developing education programs is to determine the current use of nutrition information labels. The top four parts of the label used in the present study were fat (80%), the ingredient list (80%), the nutrition claim (62%), and calories (57%). The ingredient list was used primarily for limiting additives, fat, and sugar. This is comparable to the results of two Canadian studies (Food and Consumer Products Manufacturers of Canada, 1996; National Institute of Nutrition, 1999) where fat, calories, and a list of ingredients were the top three nutrition information priorities. It is also similar to the results of American and international studies. Additives were included in the top three parts of the label used by Norwegian consumers in a study by Wandel (1997) which is also a concern of the participants from this study. Cholesterol was included in the top three parts of the label used for American (Neuhouser et al., 1999) and New Zealand consumers (Scott & Worsley, 1997), whereas it was ranked 11th in reported use by participants from this study.

In response to an open-ended question related to reasons for use of the label information, 48% of participants indicated they use the nutrition information on labels to limit nutrients perceived to be harmful including fat, calories, sugar, salt, cholesterol, and additives. Forty-four percent used the information to determine if a product is a healthy choice. The reported use differs somewhat from the literature reviewed but this may be due to the provision of a list of choices rather than asking participants an open-ended question. Reid (1992) reported that consumers used labels primarily for choosing between products or when buying a new product. Levy and Fein (1998) reported that
78% of consumers were able to accurately compare two products, which was the highest score for four performance tasks using the nutrition label. The National Institute of Nutrition (1999) study found that consumers tend to use labels for determining the nutrient composition for specific nutrients, to get a general idea of the calorie content of a food, and for comparing similar or different foods. Most respondents in an Irish study (Shine et al., 1997b) reported using labels to know what they were eating and to determine the nutrient content of foods. The three main reasons reported by New Zealand respondents (Scott & Worsley, 1997) for using nutrition labels were for health maintenance, for first time purchases, and when comparing brands of foods. Levy and Fein (1998) and Levy et al. (1992) studied the ability of consumers to use the nutrition information on labels to place food into the context of a daily diet with disappointing results. Sixty-six percent of telephone participants in this study did not use the nutrition information on food packages to help plan their overall diets. Eighty-six percent of these participants did not want help in this area. This may be a task that they are not willing to undertake in a purchase decision context.

Dietary fat is a well-known risk factor for some of the leading causes of death and disability including heart disease, cancer, and stroke (Health Canada, 1999). The high rate of use for the fat portion of the label confirms that consumers are aware and are acting on messages related to fat and nutritional health. Differences in dietary recommendations between countries may help to explain the differences in the nutrition information used by consumers. For example, Canadian guidelines for healthy eating do not include references to cholesterol intake (Health and Welfare Canada, 1990), whereas American dietary guidelines recommend that people should limit their cholesterol intake.
(United States Department of Agriculture, 2000). Eleven percent (4) of telephone participants mentioned that they didn’t use labels for nutrients perceived to be beneficial including fibre, vitamins, and minerals because they relied on fruits, vegetables or supplements for these nutrients. The pilot study conducted by Wandel (1997) found similar results.

The Health Belief Model (Strecher & Rosenstock, 1997) can be used to explain why consumers use or don’t use all or part of the nutrition information on food labels. The model is based on the theory that consumers must believe they are susceptible to a condition that has severe consequences before they will think about taking a preventive action. Only 39% of participants reported using the minerals portion of the nutrition label, which includes calcium and iron. Forty-two percent of telephone participants reported they didn’t use some parts of the label because they weren’t concerned with those nutrients and their health. Although 24% of telephone participants did not understand some of the nutrition terms, which may be added to the core list, they were not interested in any help to understand these terms. Participants who are not using certain parts of the label may be in the pre-contemplation or beginning stage of motivational readiness for behavioural change for using these parts.

The Health Belief Model (Strecher & Rosentstock, 1997) and the Stages of Change Model (Prochaska et al., 1997) advocate for education directed to increasing peoples’ awareness of their susceptibility to conditions related to nutritional health and the consequences of unhealthy food choices. For example, it may be necessary to raise the level of awareness of the susceptibility of individuals to calcium and iron deficiencies and the consequences of these deficiencies before consumers will use these nutrients to
improve the healthfulness of their food choices. For higher stages including, contemplation, preparation, action, and maintenance, different education programs are necessary. Twenty-one percent (8) of telephone participants in this study replied that they didn’t use some parts of the nutrition information label because they didn’t understand how to use that part of the label. When the serving size portion of the label was discussed with telephone participants, there was a great deal of confusion with this part of the label, which had one of the lowest reported rates of use (28%). Scott and Worsley (1997) found that a lack of interest in parts of the nutrition panel corresponded with a lack of knowledge about them. Participants who are not using the nutrition information because of a lack of understanding may be in the preparation stage and would benefit from education programs directed towards increasing their comprehension of those portions of the label they do not understand. There is a cost to the individuals who choose to use the information in terms of the time and effort to process the information (Russo, Staelin, Nolan, Russell, & Metcalf, 1986). The time allocated to grocery shopping for most people is limited. Consumers observed shopping by Moorman (1996) spent an average of 12.25 seconds searching per brand purchased. Providing quick and easy tips on how to use the label information can decrease these costs of using the information. This type of education should also enhance the self-confidence of consumers who use the label to choose healthier foods in the action and maintenance stages.
Need for Education Assistance

Originally, 13% (5) of the telephone participants wanted help to use the nutrition information on the label. This increased to 47% (18) when four proposed additions to the core list of the nutrition label by Health Canada were given and their awareness of the terms in relation to health was questioned. The increase in the number of participants requesting help supports the need for public education proposed by Health Canada in their vision statement for nutrition labelling (Health Canada, 1999). Telephone participants reported the following levels of awareness of the relationship between the four proposed nutrient additions to the core list of the nutrition label and health: saturated fat (63%), trans fat (50%) calcium (100%), and iron (95%). In a 1997 survey (National Institute of Nutrition) of Canadian consumers, the reported understanding for saturated fat was 46% and 17% for trans fat. In a 1999 survey (National Institute of Nutrition), this increased to 53% for saturated fat but remained at 17% for trans fat. When knowledge of the term, saturated fat, was tested in the 1997 survey, two thirds of those who claimed to know the meaning were able to give a correct definition. In the present study, the actual understanding of saturated fat, trans fat, and iron appeared to be lower than participants' reported understanding based on their comments during both the in-store and telephone interviews. Reid (1992) also stated that the self-reported understanding of nutrition terms was significantly higher than tested knowledge. A 1999 National Institute of Nutrition study found that 83% of respondents indicated they had some understanding of the information provided by the label. However, only 43% of these respondents claimed they understood it very well and 17% reported that it was difficult to understand.
Sixty-eight percent of those participants who wanted help, indicated they wanted the education directed towards the types of fats. Respondents to Health Canada’s (1999, November) web site survey also indicated they needed help with the types of fat. The need for help in this area is understandable based on the confusion with the terms used for the different types of fat. Twenty-four percent wanted help understanding the terms used on the label, which includes terms used in the ingredient list, nutrition claims, and the nutrition label, 16% wanted general information for a healthy diet, and 16% requested help with the % of Recommended Daily Intake (% RDI) portion of the nutrition label. Twenty-one percent of telephone participants reported difficulty with the % RDI used to report the amount of a vitamin or mineral in a food. When participants in a National Institute of Nutrition (1999) study were provided with an explanation of how to interpret and use the amount of calcium in a product in both “mg” and the “% RDI”, significantly more participants found the % RDI more useful. The % RDI in this study and the Health Canada web site survey (1999, November) referred to the reference daily intake, which is proposed to replace the recommended daily intake for the new nutrition label in Canada. Sixty-eight percent of the Institute participants claimed to have a better understanding of the % RDI after the explanation was provided. This provides an example of the importance of education to help consumers use and understand the nutrition information on labels. Respondents to Health Canada’s (1999, November) web site survey indicated that help with the % RDI is required. Educational experience with labels was found to be related to increased knowledge and self confidence by Miller et al. (1999) and greater knowledge and increased label use by Marietta et al. (1999). It is important to determine
the areas where consumers require help because the needs of the learner should be central to the adult learning process (Caffarella, 1993).

Most consumers who participated in the Health Canada web site survey (1999, November) indicated they did not need further information to use the nutrition label. When Shine et al. (1997b) asked consumers if they would be interested in obtaining further information about nutrition, 92% of label readers responded that they would be interested. The wording of the questions may have played a large role in the responses received. Canadian consumers may be interested in obtaining further information about nutrition but most do not report needing help with the label information.

Sixty-three percent of telephone participants indicated they learned how to use labels primarily on their own. Books (26%), television (24%), magazines (24%), and newspapers (18%), were the most popular sources of education information for these participants. The independent, self-directed approach to learning reported by the majority of telephone participants is one of the main distinguishing features of adult learners (Merriam, 1993).

_Who Should Provide the Education Assistance_

Despite the fact that food companies were the first choice for providing education assistance related to nutrition information on food labels by telephone participants, 39% mentioned some degree of mistrust with food companies providing the education because of their bias towards their products. This highlights the importance of collaborative education programs by food companies, government, health professionals, and grocery stores. A collaborative approach would provide the knowledge and credibility of the
health professionals and government together with the expertise and funding from all of the groups. The findings of this study lend some support to Shine et al. (1997b) who propose that co-operation between food companies and government is essential for successful education programs.

Methods for Providing Education to Consumers

The top three unaided responses to the question of how the education information should be distributed to consumers were providing handouts in grocery stores (58%), television (37%), and incorporating it into the curriculum of schools (21%). The top five choices when the aided and unaided responses were added together were providing handouts at grocery stores in holders close to the foods (90%), newspapers (88%), handouts in health offices (87%), internet (87%), and incorporating it into the curriculum of public schools (87%). Most consumers want the information to be provided at the point of use, which supports Wilson’s (1993) view that the ability of adults to think and learn is greatly affected by the availability of tools within the actual context or setting of use. Food package labels, radio/televison, and friends/relatives/colleagues were the most frequently identified sources of nutrition information chosen from a list of sources in a 1997 National Institute of Nutrition study. These sources should also be considered as methods for distributing education information. Stakeholders surveyed by Health Canada (1999) agreed that delivery of public education should be through a variety of public and private organizations to ensure that consumers receive the messages many times, by many methods. A list of tools to support public education, including print materials,
electronic and other media, is included in this report but there is no indication of the number of respondents who provided each suggestion.

**Limitations**

This study used a convenience sample of consumers to gain access to those who use nutrition information on food package labels within a limited time frame. This method of sampling does not provide a representative sample that would allow for generalisations to be made (Mertens, 1998). The study sample was limited to those who were able to read English or French and who were using nutrition information on food package labels on the specific dates the study observations took place. Those consumers who use nutrition information on labels but did not use them on the study dates were not included. An understanding of consumers who are not using labels was beyond the scope of the present research.

The study was limited to obtaining consumers' input on the educational assistance needed to facilitate their use of nutrition information. The input of other interested parties, including health professionals, food companies, government and non-government agencies, is also necessary to plan effective education programs. This was also beyond the scope of the present study. Health Canada is conducting research with these stakeholders.

The questionnaires for both in-store and telephone interviews used an open-ended question to investigate the types of help participants need to use the nutrition information on food package labels. This resulted in ambiguity when analyzing the responses because some of the categories were overlapping. For example, 24% wanted help with
the terms on the label, which may include the other two categories of types of fat and the % RDI. It would be more appropriate to provide participants with a list of choices including an “other” category, which would allow participants to provide an answer that is not on the list.

**Conclusions**

The findings of this study provide data related to consumer use of nutrition information on food package labels in a purchase decision context and input on education issues from the grassroots or local level of consumers, which are unique contributions to research in this area. The observed rate of use of the nutrition information on food package labels was 7% in this study, which was lower than expected based on reported usage levels of at least 70% of consumers surveyed in Canada and the United States (National Institute of Nutrition, 1999; Scott & Worsley, 1997). Fat, the ingredient list, nutrition claims, and calories were the top four parts of the label which respondents used. The in-store participants who reported using the ingredient list indicated they used the list primarily for limiting additives, fat, and sugar.

Most participants indicated they did not need help with using the label. The percentage of telephone participants requesting help with the label increased from 13% to 47% when the proposed changes to the nutrition label by Health Canada were explained. This indicates that help is wanted by consumers to use the new additions proposed by Health Canada to the core list of the nutrition label.

The companies who produce food products was the most frequent response to the question which asked who should provide the education assistance. However, 39% of
telephone participants mentioned some degree of mistrust with food companies providing
the education because of their bias towards their products. A collaborative approach to
educational assistance by food companies, government, health professionals, health
groups, and grocery stores should help to provide the consumer with consistent, unbiased
information.

Ninety percent of telephone participants wanted handouts at grocery stores in
holders close to the foods used as a method to provide educational support. There were
many other methods that were also supported by telephone participants such as
newspapers (88%), handouts in health offices (87%), internet (87%), incorporating it into
the curriculum of public schools (87%), and radio (85%).

Recommendations

For Further Research

A randomised sampling of shoppers rather than sampling only those who are
using the nutrition information on labels would result in a better understanding of why
the observed rate of use is so low and provide a means to assess how to reach those
consumers who are not using the information. Research with consumers who are not
using labels is required to obtain an overall view of the Canadian consumers’ perspective
on education issues related to the use of this source of nutrition information. Research
sites should be chosen in areas where shoppers tend to be from the lower income
segments of the population because low-income Canadians are more likely to die earlier
and to suffer more illnesses than Canadians with higher incomes, regardless of age, sex,
race and geographical location (Federal, Provincial & Territorial Advisory Committee on Population Health, 1999).

*For Policy Makers*

The results of this study are timely as Health Canada reviews their policies on nutrition labelling and nutrition claims, which includes a public education component. If Health Canada proceeds with the addition of saturated fat, trans fat, calcium and iron to the core list of nutrients on the nutrition label, educational support is necessary to ensure that consumers use these parts of the label. As stated in Health Canada's (1999) vision statement for nutrition labelling, public education is necessary to reinforce healthy eating practices and enhance the nutritional well-being of Canadians.

*For Education Providers*

Providing handouts in grocery stores in holders close to the foods is the most preferred method of telephone participants for distributing education information. This method has the potential to reach both users and non-users of nutrition information on food labels. Most of the suggestions for providing education to consumers were agreed to by over 80% of telephone participants. However, only 55% of telephone participants agreed with the use of direct mail. The use of many different methods enhances the chances of reaching a wide variety of consumers with different learning styles. Education on using the nutrition information on food package labels to choose healthy foods could also be incorporated into the curriculum of public schools to reach children. This should provide them with the knowledge and skills to develop healthy eating habits.

Participants from this study want help understanding the types of fat and the
% RDI. Participants from this study also indicated they want help with terms used on the label, which includes the ingredient list, nutrition claims, and the nutrition label. Health related organizations, which were not mentioned by participants in this study, could work together with food companies, government, health professionals, and grocery stores, to pool their funding and expertise and to provide consistent messages in handouts and other educational materials. The credibility provided by health professionals, government, and health related organizations might help to decrease the mistrust that 39% of telephone participants mentioned with information provided by food companies.
References


81


APPENDICES
Appendix A
Examples of a Canadian Ingredient List, Nutrition Label, and Nutrition Claim

Ingredient list:
Kraft Dinner
Macaroni: enriched wheat flour. Sauce mix: modified milk ingredients, cheese (milk, bacterial culture, salt, rennet and/or microbial enzyme, calcium chloride, lipase), salt, sodium phosphates, citric acid, colour (contains tartrazine).

Nutrition label:
Baked Beans With Tomato Sauce – Haricots secs avec sauce tomate

<table>
<thead>
<tr>
<th>NUTRITION INFORMATION</th>
<th>INFORMATION NUTRITIONNELLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>per 260 g serving (1 cup)</td>
<td>par portion de 260 g (1 tasse)</td>
</tr>
<tr>
<td>Energy</td>
<td>291 Cal</td>
</tr>
<tr>
<td>Protein</td>
<td>14 g</td>
</tr>
<tr>
<td>Fat</td>
<td>3.1 g</td>
</tr>
<tr>
<td>Carbohydrate</td>
<td>52 g</td>
</tr>
<tr>
<td>Sodium</td>
<td>1180 mg</td>
</tr>
<tr>
<td>Potassium</td>
<td>302 mg</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Percentage of Recommended Daily Intake</th>
<th>Pourcentage de l'apport quotidien recommand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thiamine</td>
<td>11 %</td>
</tr>
<tr>
<td>Riboflavin</td>
<td>8 %</td>
</tr>
<tr>
<td>Folacin</td>
<td>27 %</td>
</tr>
<tr>
<td>Calcium</td>
<td>13 %</td>
</tr>
<tr>
<td>Iron</td>
<td>62 %</td>
</tr>
</tbody>
</table>

(Canadian Food Inspection Agency, 2000, p. 4)

Nutrition claim
- Excellent source of calcium.
- Contains 8 essential nutrients.
Appendix B

Example of the Proposed “Nutrition Facts” Nutrition Label and Highlights from the Proposed Nutrition Labelling Policy

Example of the Proposed “Nutrition Facts” Nutrition Label

<table>
<thead>
<tr>
<th>Nutrition Facts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serving Size 1 cup (200g)</td>
</tr>
<tr>
<td><strong>Amount Per Serving</strong></td>
</tr>
<tr>
<td>Calories 190</td>
</tr>
<tr>
<td>% Daily Value</td>
</tr>
<tr>
<td>Fat 3g 5%</td>
</tr>
<tr>
<td>Saturated Fat 1g 10%</td>
</tr>
<tr>
<td>+ Trans Fat 1g</td>
</tr>
<tr>
<td>Cholesterol 30mg 10%</td>
</tr>
<tr>
<td>Sodium 660mg 28%</td>
</tr>
<tr>
<td>Carbohydrate 31g 10%</td>
</tr>
<tr>
<td>Fibre 4g 16%</td>
</tr>
<tr>
<td>Sugars 5g</td>
</tr>
<tr>
<td>Protein 10g</td>
</tr>
<tr>
<td>Vitamin A 4%</td>
</tr>
<tr>
<td>Vitamin C 2%</td>
</tr>
<tr>
<td>Calcium 15%</td>
</tr>
<tr>
<td>Iron 4%</td>
</tr>
</tbody>
</table>

Highlights from the Proposed Nutrition Labelling Policy

“The policy proposal is that nutrition labelling should:

• be mandatory on all foods, with exemptions provided to small business, restaurants and food service, foods packaged at retail, and fresh fruit and vegetables;
• provide core information on: calories, fat, saturated fat, trans fat, cholesterol, sodium, carbohydrate, fibre, sugar, protein, vitamin A, vitamin C, calcium, and iron;
• be consistent in look, easy to find, legible and readable; and
• be supported by education, undertaken collaboratively with leadership from Health Canada” (Health Canada, 2000, October, p. 1).
Appendix C

Glossary of Terms

Core list  A core list of nutrients that must appear every time the nutrition label is used includes the serving size, energy (measured in calories), protein, fat, and carbohydrates. The proposed core list includes saturated fat, trans fat, fibre, sodium, calcium, and iron in addition to the nutrients listed above (Health Canada, 1999, September).

Determinants of health  The factors that influence and determine health. These determinants include income and social status, social support networks, education, employment and working conditions, physical environment, biology and genetic endowment, personal health practices and coping skills, healthy child development, and health services (Hamilton & Bhatti, 1996).

Health claim  Claims characterising the relationship of a nutrient to the treatment, prevention, or cure of disease.

Health promotion  A multifactorial process for enabling people to gain control over and improve their lifestyle and conditions of living conducive to health. This can include combinations of educational, organizational and environmental supports.

Ingredient list  All packaged food must list the ingredients used in a product in descending order of the amount used, based on weight.

Lifestyle  A person’s typical way of life. Decisions and actions related to eating, drinking, smoking, and exercise are examples of personal practices that will affect a person’s health. A person’s lifestyle is influenced by cultural, social, economic, and environmental factors.

Nutrition claim  A nutrition claim is used to emphasise a nutritional characteristic of a food. It often appears on the front panel of a package. Regulations for use are set by the federal government. The nutrition claim must be supported by detailed nutrition information on that nutrient under the nutrition label (Health Canada, 1999, September).

Nutrition information on food package labels  This includes the ingredient list, nutrition label, and nutrition claim portions on a food package label.

Nutrition label  A standardized presentation of the nutrients provided by a food. Nutrients are listed under the heading, nutrition information, and are always listed in the same order. Foods are labelled as sold, not as they may be prepared. For example, nutrients are listed for the pancake mix without the other ingredients that are added at home. The current nutrition label provides nutrition information for a serving of food. The National Institute of Nutrition studies (1999) used the term, nutrition information panel, to refer to the nutrition label.
Appendix D

*In-Store Questionnaire*
In-Store Questionnaire

Code _______ Store _______________ Date _______________

Product

Nutrition Information Used

Ingredient List (specific ingredient) ___________________________ (entire list) __________________

Nutrition Claim

Nutrition Label

Serving size _____ Energy/Calories _____ Protein _____
Fat _____ (Poly ___ Mon ___ Sat ___ Trans ___) Cholesterol _____
Carbohydrate _____ Sugars _____ Starch _____ Fibre _____ Sodium _____
Potassium _____ Vitamins _____ Minerals _____

Why do you use the nutrition information on the food package labels?

Do you need help to use the nutrition information on the label? No ______
Yes _____ Please explain _______________________________________________

Demographic Profile

Gender
Female _____ Male _____

Age
18-34 years _____ 35-54 years _____ ≥ 55 years _____

Marital Status
Single _____ Married/Common-law _____
Widowed/Divorced/Separated _____

Education
Elementary _____ Some secondary _____
High school graduate _____ Some post secondary _____
Technical College graduate _____ University graduate _____

Household Income
<$25,000 _____ $25,000-$49,999 _____ >$50,000 _____

Working Status
Full time _____ Part time _____ Retired _____
Homemaker _____ Other (student/unemployed) _____

Language spoken at home
English _____ French _____ Punjabi _____
Chinese _____ Other _____

Household size
One _____ Two _____ ≥3 _____

Family Composition
Adults only _____ Children <18 years _____
Children <5 years _____
Appendix E

Telephone Questionnaire
Telephone Questionnaire

Hello, my name is Kathy Romses. I recently interviewed you at Save On Foods about the nutrition information on food package labels. Is this a convenient time to spend approximately 10-15 minutes of your time asking some further questions? The purpose of the survey is to obtain your input on why you use this information and the assistance needed to use this information effectively.

As outlined in the consent form that you signed, this interview will be taped. This information will be kept confidential. Do you have any questions before we start? If it is okay with you, I will begin taping now.

The questions that I will be asking you are related to the nutrition information on food packages. This includes the ingredient list, nutrition claims, and the nutrition label. You are free to ask and/or refuse to answer any questions. You have the right to ask that disclosed information be erased from the tape and therefore be excluded from the study.

1. What types of foods do you use the nutrition information on labels?
2. Why do you use the nutrition information for these foods?
3. How did you learn to use the nutrition information on food package labels?
4. Have you ever received any education to help you use this information? If you have, please describe.
5. In the in-store interview, you mentioned that you use ___ parts of the nutrition information label. Is there a reason that you don’t use the other parts of the nutrition information label?
6. Nutrition labelling regulations are currently under review. Saturated fat, trans fat, calcium, and iron may be added to the list of nutrients that are given every time nutrition labelling appears. Are you aware of the relationship between saturated fat, trans fat, calcium, and iron and health?
7. Do you need help to use either the existing or the proposed additions to the nutrition information label?
8. Nutrients from a combination of foods are necessary for healthy eating or a healthy diet. Do you ever use the nutrition information on the label to help plan your overall diet?
9. If the answer is no for the last question, is this something that you would like help doing?
10. Who do you think should be providing the education information to help consumers to use the nutrition information on the food label?
11. Why do you think that they should provide the education information?
12. Do you have any suggestions on how the education information should be distributed or provided to consumers? (Suggestions are provided after the participant has given their answer. Please let me know whether you agree or disagree with any of the following suggestions for distributing educational support to consumers: television, newspapers, magazines, radio, toll free number for information, handouts at grocery stores in holders close to the foods, posters at grocery stores, in store displays, home delivered materials, internet site, handouts at health units, booths at health fairs, health classes at public schools, night school classes, grocery store tours by a nutritionist or dietitian.

13. Is there anything that I didn’t ask about that you think I should know?

Thank you very much for your time. The information will be used by educators and companies to plan education programs to support consumer use of nutrition information on food package labels. I will turn off the tape now. If you would like a copy of the abstract from my research I would be happy to send it to you.
Appendix F
*Consent form*
PHONE NUMBER: ____________________________________________

Best time to call:

<table>
<thead>
<tr>
<th>Day</th>
<th>Morning</th>
<th>Afternoon</th>
<th>Evening</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunday</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monday</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tuesday</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wednesday</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thursday</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friday</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saturday</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>