

Nutrition Messages in Elementary School Textbooks: A Study of
Language Arts and Math Texts Used in English Schools
in Montreal

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Abstract

This study examines references to foods mentioned in elementary school texts used in Montreal English schools. A study of 58 language arts and math texts used in grades 1-6 revealed a total of 4,391 references to foods in words and/or pictures. A large proportion of these references were to sugar-rich foods. A higher percentage of adult females prepared foods, followed closely by adult males. Boys were shown as eating food more frequently than any other group. Eating with one's peers was far more frequent than eating with the family, while a surprising number of children depicted in texts used in grades 1-3 consumed their food alone. The results of this study suggest that, because unintended information may influence childrens' nutritional habits, more attention should be paid to concomitant messages in elementary school textbooks.

Abrégé

Cette étude fait une revue des textes utilisés comme matériel didactique au primaire. On en a dégagé les références à la nourriture. A partir de 58 textes de contenu général ou mathématique s'adressaient aux élèves de première à sixième année 4391 références ont été dénombrées qu'il s'agisse des mots ou d'images relatif à la nourriture. De ce nombre un pourcentage élevé concernant des aliments riches en sucre. Une grande partie des repas et collations fut préparé par les femmes, mais suivi de près par les hommes. Il a été démontré que ce sont les garçons qui mangent le plus souvent et ce, plus que n'importe quel autre groupe. La plupart des fois ces aliments sont consommés entre pairs, parfois seuls, mais rarement à la maison avec la famille. Comme ces messages influence les habitudes alimentaires des enfants les résultats de cette étude suggèrent d'accorder plus d'attention aux messages caches ou involontaires véhiculés aux élèves dans l'information scolaire écrit.

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Introduction

Good nutrition plays an important role in the physical and mental performance of an individual and is most essential to good health. Because physical and mental health are prerequisites for success in school and because school is where a child spends a good portion of his waking hours, schools have an obligation to teach children how to make appropriate food choices. Students must be taught to develop the ability to analyze and evaluate the wide range of food and nutrition messages they receive at home and in the popular culture.

"Nutrition education is the sum total of the experience, knowledge, and skill possessed by the individual and the family and used to translate health concerns into the art of buying and consuming food (Peterson, 1980, p 92)." The purpose of this education is to "enable individuals to gain the understanding and skills necessary to promote and protect their nutritional well being through their food choices (Ullrich, 1979, p 60)." Nutrition must not only be taught, but good nutritional practices must be constantly reinforced.

It is important that the textbooks used in academic subjects reinforce the concepts of good nutrition and encourage good dietary habits. The object of this study is to

determine what nutrition messages are being given in the elementary school texts used for language arts and mathematics in English schools in the greater Montreal area. A total of 58 textbooks used in the Laurenval School Board were examined for references to food. An analysis of these references follows a review of the literature and concludes with a discussion of the nutritional messages conveyed by these textbooks.

Review of Research

Charlton-Seifert et al (1979) reviewed research on the relationship between nutritional deficiencies and academic performance. They showed that "nutrition is critical to the physical well-being, neurological function and learning and to the educational motivation of an individual (Charlton-Seifert et al 1979, 1). It was found that many children were undernourished but not underfed. An inadequate diet is known to lead to fatigue, to reduce attention span, and produce apathy and listlessness. Conversely, an improvement in diet results in better learning and fewer absences. As well, according to Gilbert et al (1983), more nutrition related diseases are associated with dietary excesses and imbalance than with dietary deficiencies.

It was the hope and expectation that when nutrition education programs were started in public schools in North

America at the turn of this century, that children would develop a set of beliefs and attitudes that would lead to nutritionally sound food behaviours. Unfortunately, much research has shown that this is not so. Weiss & Kien (1987) found that while nutrition education may increase knowledge, this is not sufficient to alter behaviour. Their findings were supported by Toulatos et al (1987) who sought to correlate nutritional knowledge and dietary behaviour in a study of children 10-13 years old. The results indicated that the older children knew more about nutrition but had less adequate diets. In fact, there appeared to be a negative relationship between nutrition knowledge and dietary quality!

Weiss & Kien cited several reasons for the failure of nutrition education programs. Chief among them were poor teacher training, the low priority given health and nutrition education in elementary schools, and the ad hoc manner in which nutrition is taught. In many North American schools, teachers use their own discretion in choosing topics and activities in teaching nutrition, and the programs lack coherence. The powerful influence of the students' home environment and the popular culture, especially television, also reduce the effectiveness of these programs.

Isobel Contento (1981) pointed to another reason for the failure of nutrition education in elementary schools. She

believes that these programs are not successful because they have not taken into account the developmental level of the students. According to Piaget, children until the age of 7 or 8 lack the ability to use causal reasoning. They cannot make the connection between the food they eat, where it goes, and what it does in their bodies. Older elementary school children (aged 8-12) have difficulty understanding words like "nutrients", "vitamins", and "proteins" since their reasoning ability is not yet ready to handle these abstract concepts. Contento's findings suggest that nutrition education for children should be based more on concrete information and experiences from the real world in order to help children distinguish between which foods to eat and which to avoid.

Children also receive a great deal of information, and misinformation, about diet and nutrition from many other sources - television, children's literature, family, friends, advertisements as well as from school textbooks. While there has been some concern lately about messages sent through television and advertisements, little attention has been paid to the subtle nutritional messages, both supportive and countersupportive of good nutrition, in stories, illustrations and examples used in textbooks adopted by the schools.

Textbooks are the dominant instructional tool in the classroom. Although they have changed and evolved in format

and design, the textbook is the most important resource used by the teacher and students at all levels of instruction. As Cronbach (1955) stated, "only the teacher, blackboard and writing materials are used as universally and at all grade levels as the textbook." In a paper given at the meeting of the Association of American Publishers in 1979, Fitzgerald noted that teachers rely on and believe in the textbook as a source of knowledge. In addition to being used to teach subject matter and reading skills, they are also used to teach the values of the society (Fitzgerald 1979). Textbooks have always been used for the teaching of values and the socialization process.

Helen Huus (1978) has pointed out, in discussing children's literature, that while literature is primarily for enjoyment this does not exclude concomitant learning of information, attitudes and appreciation. Anthony Manna (1984) suggests that informational books appropriate to the needs and interests of children can help to reinforce concepts and to personalize the information received in nutrition and health programs. By giving a child the opportunity to take part in a character's experience in a story, it can make him more aware of how he may act in a similar situation.

Little attention has been paid to concomitant or incidental learning. In 1978 Jeannette Dittman described concomitant learning as

"...those things that are learned when the teacher or student is consciously trying to achieve some other learning. Although students may learn facts incidentally it is the affective incidental learnings that have the greatest possibilities for influencing students lives. These unrecognized feelings, attitudes and values act as hidden persuaders and may affect students in a more lasting way than the knowledge and skills teachers intend to teach (Dittman 1978, p 3)."

She goes on to say that "desired incidental learnings need to be identified and ways to facilitate their development planned and implemented in the classroom (Dittman 1978, p 3)." Instructional methods and materials used in the classroom should facilitate both intended and incidental learning.

Children spend more time in school learning to read, write and do maths, than in learning about nutrition and health. In Quebec elementary schools, approximately 50% of instructional time is devoted to language arts and math, 30% to French, social studies and art and the remaining 20% to science, physical education and moral and religious education.¹ Nutrition, when taught, is usually integrated with one of the other subjects such as science.

¹. The Ministry of Education of Quebec determines the courses and the number of minutes per weeks of instruction in each.

The books used in reading, math, etc. are likely to have a greater influence than those used for the relatively few hours spent on health and nutrition. D'Onofrio and Singer (1983) reported on a study done in 1979 which analyzed 1,204 readers and workbooks used in California for grades K-3. These books were evaluated for their nutritional content. It was found that:

"...the children are bombarded with pictures, stories and problem-solving exercises in which sweets appear more frequently than foods from the basic four food groups. Additionally, children, adults and families in readers purchase, prepare and eat sugar rich foods more than those in any other category, while snacks, treats, and pastries outnumber regular meals as occasions for eating (D'Onofrio and Singer, 1973, p 524)."

The authors believed that so many references to sweet foods do not encourage good eating habits.

In 1984, Guthrie and Sheehe analyzed the nature of nutrition messages in American school texts published between 1973-1979 and used in the United States in grades K-3. Food references were found in almost all the texts and many of these foods were of limited nutritional value. At the same time in nutritional classes, the children are taught to choose foods from the four basic food groups, eat regular meals and avoid too many sweets. Students are, apparently, getting mixed messages from the educational milieu - one message from

health and nutrition classes, and concomitantly or incidentally, contradictory messages while learning other subjects.

Methodology

A total of 58 textbooks and workbooks used by the English language sector in grades 1-6 language arts and mathematics were studied for references to food in either words or pictures. The books reviewed were among those currently used in the English elementary schools of one of the largest school boards in the greater Montreal area. These texts are selected from a list approved by the Ministry of Education.

Each textbook was reviewed and the number of illustrations and references to food was categorized and tabulated. Foods that were used as proper nouns such as "Cookie" or personified, such as "Mr. Peanut" were not counted. Animals "on the hoof" such as cows or sheep were not counted and fowl, chickens, ducks, and fish only if they were presented in an edible state. Combination foods such as sandwiches, soups, pizza etc. were categorized separately as were fats, oils, spices and condiments. A picture of a bunch of bananas or a pile of apples was counted as one fruit. In a math text where a row of apples or candies were pictured (e.g. 10 apples or 10 caramels, - to be added or subtracted), this, too, was considered as one item. However, if the candy

was described by different names (caramel, lifesavers, gumdrops), each type was considered as a separate sugar-rich food.

Foods were categorized as fruits and vegetables, meat and alternates (poultry, fish, nuts, and legumes), dairy products and sugar-rich foods. In the last category were those foods high in sugar relative to other nutrients, i.e. cake, cookies, ice cream, etc. In addition, information relating to who handled or ate the food, with whom and where, as well as whether the food was central or incidental to the theme of the story, was coded and entered into the data base. There was a total of 4,391 references to foods in the 58 texts studied. The following table shows the characteristics of the texts studied. The place and date of publication, the subject and the grade level were tabulated.

Table 1
Characteristics of Texts Studied

	N	%
1. <u>Place of Publication</u>		
United States	16	28
Canada	<u>42</u>	<u>72</u>
Total	58	100%
2. <u>Date of Publication</u>		
Before 1981	28	48
1981-1984	22	38
1985-1988	<u>8</u>	<u>14</u>
Total	58	100%
3. <u>Subject of Text</u>		
Language Arts	52	90
Mathematics	<u>6</u>	<u>10</u>
Total	58	100%
4. <u>Grade Level</u>		
1	18	31
2	10	17
3	9	15
4	8	14
5	8	14
6	<u>5</u>	<u>9</u>
Total	58	100%

According to Table 1 almost three fourths (72%) of the texts were published in Canada. However, since all Canadian publishing companies represented are subsidiaries of American publishing houses, these texts, even those with Canadian

content, are influenced by textbooks published in the United States.

It can be seen that almost 50% of the texts used were published before 1981, with a very few (only 8 or 14%) published in 1985 or later. A large proportion (43%) of books published after 1981 were texts published by Canadian publishers Gage, Holt, Rinehart and Winston, and McGraw Hill-Ryerson. It appears that textbook selection policies increasingly favour "Canadian" publishers as newer textbooks are introduced.

Language arts basal readers make up almost 90% of the texts studied. There were only 6 mathematic texts or 10% of the number studied. Each grade level has only one mathematics text, but several basal readers. At the lower levels there are more readers than at the higher grades. This can be explained by the fact that at the higher grade levels, textbooks in subjects other than language arts and mathematics are introduced. As well, at the higher levels more outside reading is encouraged for preparation of book reports and student research projects. Budgetary considerations may be another reason for the use of fewer basal readers in the higher grades. As one of the school board's language arts consultants indicated, a new series is first introduced in the lower grades, usually one year at a time, and by the time the

upper grades are ready to be phased in the budget may not be able to cover the cost of the new books.

In school, students are expected to learn what they read in their textbooks. The information and values expressed therein are sanctioned by educational authorities. Thus, any nutritional messages passed on through these texts may influence the students' nutritional beliefs and habits. The data analysis will focus on the following questions:

1. Which foods are cited most frequently in words or pictures?;
2. Are there more sugar-rich foods cited in language arts texts or in math texts?;
3. Is there a difference between American and Canadian texts in the kinds of foods cited?;
4. Do more recently published texts contain fewer references to sugar-rich foods?;
5. Are there more sugar-rich foods cited in lower or higher grade level texts?;
6. How do these texts represent male and female roles in food preparation and the various social contexts in which foods are handled and consumed?

Research Results

The individual citations were first classified according to the same characteristics as the texts; namely, by place and

date of publication, subject and grade level with the added category of the type of reference, whether word or picture. The following table (Table 2) presents the corpus of citations as described by these characteristics.

The foods were categorized in terms of whether they belonged to one of the four basic food groups or were sugar-rich foods (Table 3). References to these food groups were then analyzed according to the characteristics of the texts; i.e. by place and date of publication, subject and grade level (Tables 4, 5, 6 and 7).

Table 2
Characteristics of Citations

1.	<u>Citations from texts published in:</u>	N	%
	United States	1216	28
	Canada	<u>3175</u>	<u>72</u>
	Total	4391	100%
2.	<u>Citations from texts published</u>		
	Before 1981	1868	42
	1981-1984	2055	47
	1985-1988	<u>468</u>	<u>11</u>
	Total	4391	100%
3.	<u>Subject of text</u>		
	Language Arts	3075	70
	Mathematics	<u>1310</u>	<u>30</u>
	Total	4385	100%

4. Kind of citation

word	2923	67
picture	<u>1455</u>	<u>33</u>
Total	4378	100%

The percent of citations from the American texts, 28% (Table 2), was the same percentage as the percent of American texts studied - 28% (Table 1). Therefore, the number of times foods were mentioned were about equal in the American and Canadian textbooks. Foods were mentioned more often after 1981 than before; 58% after 1981 as opposed to 42% before 1981.

Although there were only six math books making up 10% of the texts, the percentage of food citations in math texts is 30% of the total, about two-thirds in words and one-third in pictures. This may be due to the fact that, especially in the lower grades, pictures of foods are more often used in learning addition and subtraction. Except at the grade 3 level, it would appear that the number of foods referred to decreases as the grade level increases; and that, except at the grade 5 level, the number of pictures of foods decreases as the grade level increases (Appendix 1).

In order to categorize the nutritional characteristics of the foods cited in the texts, Canada's Food Guide (1983),

distributed by Health & Welfare Canada, was followed. Foods were divided into four food groups, each group supplying a different set of essential nutrients. Dairy products supply the calcium required for strong bones and teeth; the meat and alternate protein group (nuts, legumes, fish, poultry) supply the protein necessary for the growth and repair of cells; breads and cereals supply the complex carbohydrates required for strength and energy; and fruit and vegetables supply the vitamins and minerals necessary to make all the other nutrients fully effective. Another food group was added which is not mentioned in Canada's Food Guide - sugar-rich foods. These are foods which have a high content of sugar in relation to the other nutrients used in the preparation of such food (i.e. candy, cake, pies, etc.). Table 3 categorizes the foods mentioned in the texts.

Table 3
Nutritional Characteristics of Foods Cited

<u>Food Group</u>	N	%
Fruits and Vegetables	1150	30
Meat and Alternates	630	17
Dairy Products	290	8
Breads and Cereals	399	10
Sugar-rich Foods	<u>1322</u>	<u>35</u>
Total	3791	100%

As Table 3 indicates, sugar-rich foods such as ice cream, cakes, cookies, and candies made up about one-third of the foods cited, while fruit and vegetables, the next in frequency, also comprised about one-third of the citations. Dairy products were the least cited foods accounting for only about 8% of the food references.

Combination foods (sandwiches, pizza, soup) and miscellaneous foods (fat, herbs, condiments, tea, coffee) were categorized separately and do not appear in Table 3. These two categories account for 517 or 12% of the total food citations.

Table 4
Nutritional Characteristics of Foods
Cited by Subject of Text

Food Group	Language Arts		Mathematics	
	N	%	N	%
Fruits and Vegetables	801	30	444	38
Meats and Alternates	491	18	137	12
Dairy Products	223	8	64	5
Bread and Cereals	324	12	74	6
Sugar-rich Foods	<u>857</u>	<u>32</u>	<u>458</u>	<u>39</u>
Total	2696	100%	1177	100%

Table 4 demonstrates that a slightly higher percentage of sugar-rich foods were referred to in the mathematics texts than in the language arts texts, 39% as opposed to 32%.

Fruits and vegetables and sugar-rich foods made up almost 80% of the total in mathematics texts and only 62% of the total in language arts texts. The percentage of references to meats and alternate sources of protein was lower in the mathematics texts than in the language arts texts (12% versus 18%).

Table 5

Nutritional Characteristics of Foods
Cited by Country of Publication

	U.S.		Can.	
	N	%	N	%
Fruits and Vegetables	349	33	897	32
Meat and Alternates	189	17	439	15
Dairy Products	92	9	195	7
Bread and Cereals	125	12	274	10
Sugar-rich Foods	<u>307</u>	<u>29</u>	<u>1011</u>	<u>36</u>
Total	1062	100%	2816	100%

As indicated in Table 5, sugar-rich foods were cited slightly more often in Canadian texts (36%) than those published in the United States (29%). There was little difference between Canadian and U.S. texts in the frequency of citations to other foods. This may reflect the tendency of American publishers to respond more quickly to the increased awareness of the public to health issues in general and to concerns about good nutrition in particular. Textbooks

published after 1984, show a tendency to refer to more nutritious foods (Table 6).

Table 6

Nutritional Characteristics of Foods
Cited by Date of Publication

Food Group	Before 1981		1981-1984		1985-1987	
	N	%	N	%	N	%
Fruits and Vegetables	515	32	617	34	114	27
Meat and Alternates	284	17	245	13	99	23
Dairy Products	150	9	101	6	36	9
Bread and Cereals	187	12	143	8	69	16
Sugar-rich Foods	<u>495</u>	<u>30</u>	<u>717</u>	<u>39</u>	<u>105</u>	<u>25</u>
Total	1631	100%	1823	100%	423	100%

Here, in Table 6, we note that the percentage of sugar-rich foods referred to was higher in the texts published between 1981-84 (39%) but considerably lower in those published later, (25%). A higher percentage of meats and alternate proteins as well as bread and cereals were also cited in the texts published after 1984. This again may reflect a response to the increased interest of the general public behaviour designed to improve health.

Table 7

Nutritional Characteristics of
Foods Cited by Grade Level

Food Group	Grade Level											
	1		2		3		4		5		6	
	N	%	N	%	N	%	N	%	N	%	N	%
Fruits and Vegetables	363	41	253	29	141	36	148	21	211	31	130	32
Meat and Alternates	92	10	143	17	66	17	103	15	165	24	59	15
Dairy Products	62	7	69	8	28	7	44	7	55	8	29	7
Bread and Cereals	61	7	92	11	40	10	83	12	84	13	68	17
Sugar-rich Foods	<u>307</u>	<u>35</u>	<u>304</u>	<u>35</u>	<u>117</u>	<u>30</u>	<u>304</u>	<u>45</u>	<u>165</u>	<u>24</u>	<u>118</u>	<u>29</u>
Total	885	100%	861	100%	392	100%	682	100%	680	100%	404	100%

It appears, in Table 7, that the percentage of sugar-rich foods cited in the lower grades, (grades 1-4) was higher, (35% to 45%), than in grades 5 and 6 (24% to 29%). The number of references to meats and alternates varied from 10% to 24%, while references to dairy products were about the same for the various grade levels (7% to 8%). Citations to fruits and vegetables vary the most, from 21% to 41%, with the highest percentage at the grade 1 level.

I will now look at the context in which the foods were mentioned in word or picture: whether the food was being eaten, prepared, bought; whether the food was eaten alone or with others, the occasion for eating, who handled the food, where the food was eaten or displayed, and whether the food was central or incidental to the theme of the story.

Table 8
Management of Food

1.	<u>Manipulation of Food</u>	N	%
	Food eaten	873	38
	Food prepared or processed	422	19
	Food purchased/displayed	940	41
	Other	<u>55</u>	<u>2</u>
	Total	2290	100%
2.	<u>Food Event</u>		
	Meal	418	53
	Treat	269	35
	Picnic	<u>96</u>	<u>12</u>
	Total	783	100%
3.	<u>Characteristics of Those Handling Foods</u>		
	Adult Male	214	16
	Adult Female	149	11
	Male Child	338	26
	Female Child	290	22
	Non Human	<u>324</u>	<u>25</u>
	Total	1315	100%
4.	<u>Social Context in Which Food was Consumed</u>		
	With family	145	31
	Alone	106	23
	With peers	<u>217</u>	<u>46</u>
	Total	468	100%

5. Place where Food was Handled

Home	482	40
Store/Restaurant	388	32
School	32	2
Outdoors	277	23
Other	<u>36</u>	<u>3</u>
Total	1215	100%

6. Relation of Food Citation to Theme of Story

Central	1303	62
Incidental	<u>785</u>	<u>38</u>
Total	2088	100%

According to Table 8, over half (57%) of the foods handled were either eaten or being prepared for eating, while 53% of food events were meals. If picnics are treated as meals then 65% of food events were meals. Treats, which include snacks and parties, account for 35% of the occasions where food is consumed. Children handled food half (50%) of the time. Interestingly, male adults and children handled foods slightly more often than females. However, when looking at the social context in which foods were eaten most (69%) of the food events took place outside the family context. Only 40% occurred in the home. The foods cited were central to the

theme of the story or event in almost two-thirds (62%) of the cases.

The next table, Table 9, considers by grade level the food event and social context in which the food was consumed.

Table 9
Food Event Cited by Grade Level

1. Food Event	Grade Level											
	1		2		3		4		5		6	
	N	%	N	%	N	%	N	%	N	%	N	%
Meal	51	53	140	52	50	61	71	50	77	52	29	63
Treat	17	18	97	36	31	39	59	42	51	34	11	24
Picnics	<u>28</u>	<u>29</u>	<u>31</u>	<u>12</u>	<u>0</u>	<u>0</u>	<u>11</u>	<u>8</u>	<u>20</u>	<u>14</u>	<u>6</u>	<u>13</u>
Total	96	100%	268	100%	81	100%	141	100%	148	100%	46	100%

2. Social Context	Grade Level											
	1		2		3		4		5		6	
	N	%	N	%	N	%	N	%	N	%	N	%
Family	18	18	41	34	25	28	28	45	24	44	9	22
Alone	33	33	35	29	21	24	6	10	9	16	2	5
With Peers	<u>49</u>	<u>49</u>	<u>45</u>	<u>37</u>	<u>42</u>	<u>48</u>	<u>28</u>	<u>45</u>	<u>22</u>	<u>40</u>	<u>30</u>	<u>73</u>
Total	100	100%	121	100%	88	100%	62	100%	55	100%	41	100%

At all grade levels most foods were eaten in the context of meals, including picnics. It appears that although most foods were eaten in the context of a meal, they were eaten with one's peers, with the highest percentage (78%) of such meals occurring at the grade 6 level. Surprisingly, in the texts used in grade 1, almost half (49%) of foods were eaten with one's peers, a third (33%) alone and only 18% were eaten with the family. There also seems to be an inverse relationship between the grade level and the consumption of food alone, with more children eating alone in grade 1 (33%) than in grade 6 (5%). Eating with the family is the least often mentioned social context, especially at the lower levels.

Tables 10-13 examines the difference in the frequency of various food events by country, date of publication and subject of the text.

Table 10
Food Event Cited by Country of Publication

Food Event	Country			
	United States		Canada	
	N	%	N	%
Meal	201	53	217	54
Treat	127	33	142	35
Picnic	<u>52</u>	<u>14</u>	<u>44</u>	<u>11</u>
Total	380	100%	403	100%

Table 11
Food Event Cited by Date of Publication

Food Event	Date					
	Before 1981		1981-84		1985-88	
	N	%	N	%	N	%
Meal	252	50	82	54	84	70
Treat	180	35	67	44	21	18
Picnic	<u>77</u>	<u>15</u>	<u>4</u>	<u>2</u>	<u>15</u>	<u>12</u>
Total	509	100%	153	100%	120	100%

Table 12
Food Event Cited by Subject of Text

Food Event	Subject			
	Language Arts		Mathematics	
	N	%	N	%
Meal	403	54	15	42
Treat	246	33	21	58
Picnic	<u>96</u>	<u>13</u>	<u>0</u>	<u>0</u>
Total	745	100%	36	100%

There was no significant difference between American and Canadian texts in the percentage of meals, treats and picnics cited. However, the date of publication does seem to make a difference. After 1984, 70% of foods cited were in connection with meals, with only 18% connected with treats. In books published before 1984, there was a slightly lower percentage of foods eaten at meals, 50% before 1981 and 54% between 1981-1984.

There was a higher percentage of references to foods consumed as treats in recent years; 35% before 1981 and 44% between 1981-1984. The subject of the text seems to make a difference as well. In the language arts texts, there were more meals (54%) and fewer treats (33%) whereas in the math texts it was reversed - there were fewer meals (42%) and more treats (58%). This difference may be due to the fact that in math texts, most foods were used as isolated examples to calculate or to solve problems, while in the readers used for language arts, foods were usually part of a story or a theme in the passage.

Table 13

Nutritional Characteristics of Foods Cited by Food Event

Nutritional Characteristics	Food Event					
	Meal		Treat		Picnic	
	N	%	N	%	N	%
Fruits and Vegetables	79	18	37	15	13	20
Meat and Alternates	101	23	14	6	8	13
Dairy Products	34	7	19	8	11	17
Bread and Cereals	178	40	23	9	12	19
Sugar-rich Foods	<u>53</u>	<u>12</u>	<u>151</u>	<u>62</u>	<u>20</u>	<u>31</u>
Total	445	100%	244	100%	64	100%

Bread and cereals were the foods most often cited in connection with meals, 178 citations (40%) followed by meat and alternate proteins (23%). Dairy products were the least often mentioned in connection with any event in which food was eaten. Almost two-thirds of treats were sugar-rich foods. At picnics, one-third of the foods eaten were sweets, while meals contained the least amount of sugar-rich foods (12%).

In the following table, Table 14, citations to the four basic food groups were combined and compared to references to sugar-rich foods to examine the nutritious aspect of the food events depicted.

Table 14

Food Event Cited by the Nutritional
Characteristics of Foods

Food Event	Nutritional Characteristics of Foods			
	Basic Food Group		Sugar-rich Foods	
	N	%	N	%
Meal	392	72	53	24
Treat	94	17	151	67
Picnic	<u>59</u>	<u>11</u>	<u>20</u>	<u>9</u>
Total	545	100%	224	100%

In considering Table 14, we can see that 72% of the meals contain at least one of the four basic food groups while 24% of the meals contain a sugar-rich food. However, only 17% of treats refer to one of the basic food groups. More than two thirds (67%) of the treats contain a sugar-rich food. Insofar as picnics are concerned, there were about an equal proportion of references to the two kinds of foods (11% to basic food groups and 9% to sugar-rich foods).

The following table shows the characteristics of individuals, male, female, child, adult, handling the food in reference to whether the foods were eaten, prepared or processed, sold, displayed or listed.

Table 15
Characteristics of Individuals Handling Foods

Individuals	Manipulation of the Food							
	Food being eaten		Food being prepared		Food being purchased or displayed		Food held	
	N	%	N	%	N	%	N	%
Adult M.	86	12	80	24	31	22	9	18
Adult F.	25	4	96	29	16	12	0	0
M. Child	196	28	76	23	43	30	14	28
F. Child	159	22	61	18	34	24	18	36
Non Human	<u>241</u>	<u>34</u>	<u>20</u>	<u>6</u>	<u>18</u>	<u>12</u>	<u>9</u>	<u>18</u>
Total	707	100%	333	100%	142	100%	50	100%

Table 15 shows that non humans, animals or imaginary characters, ate most of the foods (34%), followed by male children (28%). Female children appear to be more passive, holding foods more often (36%) than anyone else. Adult females prepared food most often 29%, followed closely by male adults, 24%, although women ate only 4% of the foods cited. Women are seen by society as nurturing and therefore they usually prepare foods for others to eat. The relatively high percentage of men preparing and buying food may be due to the number of stories in basal readers that use themes such as exploration, camping and fishing trips in which men predominate. The close relationship between children eating and preparing foods - children eating 50% and preparing 41% of the foods cited may reflect the reality that many children prepare their own snacks, and, very often, their own meals as well.

Discussion

In sum, a large proportion of food references were to sugar-rich foods, especially at the lower levels. The date and country of publication were related to the kinds of foods cited. There were more references to nutritious foods in texts published after 1984. Those published in the United States had a slightly lower percentage of citations to sweets. A higher percentage of foods were prepared by adult females

followed closely by adult males. Male children, not surprisingly, were depicted as eating foods more often than any other group. Eating with one's peers was far more frequent than eating with the family, while a surprising number of children depicted in the grade 1-3 texts consumed their food alone.

It was concern about the health and nutritional status of elementary school children which prompted this study. Children do receive some education about nutrition, albeit rather haphazardly and depending on the inclination and knowledge of the teacher. By the time they reach grade 6 students may know what one should eat for breakfast, which foods are healthy and which are considered "junk foods." However, their behaviour may not, for the most part, reflect this knowledge.

The objective of this study was to determine if what is taught about nutrition is reinforced in textbooks used for the principal academic subjects in elementary schools. It was decided to do a study similar to the one done in California in 1984 by Guthrie and Sheehe. They examined texts, published between 1973-1979, used in grades K-3 for food references and their nutritional value. The conclusion of that study was that many of the foods referred to were of limited nutritional value. Wondering if the same situation exists in Canada, it

was decided to analyze the texts used for language arts and mathematics in the English schools of one of the school boards in the Montreal area. The results are similar. Guthrie and Sheehe reported a ratio of nutritious to non-nutritious foods ranging from 1:2 in Kindergarten to 1:3 in grade 3, while the present study showed that one-third of foods referred to in the texts used in grades 1-6 were sugar-rich foods of little or no nutritional value.

Foods depicted during "fun" times (i.e. at parties and special occasions) were in most cases the sugar-rich foods. Pictures of birthday parties and festive occasions show tables laden with sweets and cakes. Cotton candy and lollipops were shown in connection with the circus and carnivals where everyone is having fun. Conversely, fruit and vegetables are usually shown at mealtimes or in a store on display being bought and sold. Sugar-rich foods were presented far more often as treats or foods for special occasions than any other kind of food. These foods associated in the textbooks with happy times such as birthday parties or Halloween parties, and the idea that these foods are special foods is reinforced. Using candy as a reward or as a treat equates it with being "good" in the child's mind. Parties are fun, therefore foods served at parties are considered special foods. This imparts a positive value to foods which have little nutritional value.

We can conclude from this study that the nutrition messages being implicitly transmitted by elementary school textbooks are not reinforcing whatever explicit nutrition education is being given in health and/or nutrition classes. The implied message is that sweets, cakes, and candies are good foods. With this message being repeated over and over again, we can understand why many students may not integrate, internalize and act upon knowledge of good nutrition.

In the texts published after 1984, there appears to be a little more effort made in reinforcing the value of good nutrition. Although the sample is small, there is some evidence of such a trend. There is a greater percentage of foods mentioned in connection with meals than with treats. As indicated earlier, this may be due to increased public interest in health issues. The increasing number of health and exercise clubs, nutrition clinics and natural food stores is the private sector's response to this interest. School texts may take a little longer to reflect these changes.

It may be true that what is in these texts reflects real life. We know that party foods and treats consist mainly of sweets. But few children will choose vegetables or fruits over candy and cakes as a party menu because they have read over and over again that cakes and sweets are usually served at a party. If texts are used to socialize students and

impart the values of society then they can and should be used to reinforce the value of good nutrition.

The notion that young people be given high ideals to emulate is deeply ingrained in our culture. In the past two decades the social context of textbooks has changed dramatically. Since the sixties and seventies many legislatures and school boards have enacted laws requiring fair treatment of minorities and women in school textbooks. Ethnic slurs and put-downs based on gender have been virtually banished. It is time now to concentrate on promoting other changes, other values. It is time to increase the awareness of health in the school, to emphasize its importance and to encourage young students, at an early age, to make the choices necessary to promote and maintain good health.

Radio, television and the written media have recently begun to advertise the importance of making choices necessary to maintain good health. We see and hear advertisements promoting dairy products, promoting safety by wearing seat belts, advertisements against alcohol and drugs, and so on. We are seeing fewer and fewer advertisements for alcohol, cigarettes and candy, especially during the hours when children are most likely to be watching television. The Canadian Radio and Television Commission, for example, has restricted the advertising of "junk foods" during children's

programs. Should not school texts also be representing the ideals of good health and good nutrition? Given our present lifestyle featuring snacks and convenience foods, it is necessary for children to develop skills in making informed decisions and proper food choices in real life contexts.

Appendix

Table 16

Number of Citations by Grade Level
in Words and Pictures

Grade Level	Words		Pictures	
	N	%	N	%
1	328	11	651	45
2	576	20	404	28
3	345	12	135	9
4	686	23	84	6
5	655	22	106	7
6	<u>332</u>	<u>12</u>	<u>74</u>	<u>5</u>
Total	2922	100%	1454	100%

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