

THE UNIVERSITY OF MANITOBA
AN INVESTIGATION OF THE RELATIONSHIP BETWEEN
NUTRITION KNOWLEDGE AND DIETARY PRACTICES
OF TWO GROUPS OF HIGH SCHOOL GIRLS

by

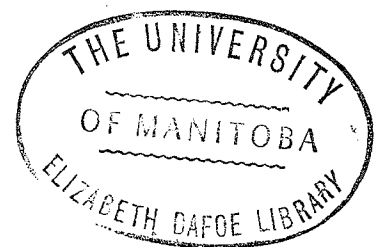
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ABSTRACT

Two groups of grade XII girls and their mothers were surveyed in order to determine what relationships exist between nutrition knowledge and the dietary practices of the girls. The research girls have had approximately 1100 hours (about 45 days) of nutrition instruction, and the control girls approximately 500 hours (20 days). The groups were matched on several variables related to family background, and therefore differed mainly in the amount of exposure to nutrition instruction.

It was hypothesized that research girls would have better knowledge of nutrition than control girls, and that nutrition knowledge would be reflected in dietary practices. Therefore research girls would have better dietary practices than control girls.

A group-administered questionnaire was used to collect data from the girls, and the mothers were interviewed. Food intake was scored according to a modified form of the system in the Nutrition Division's Food Habits Survey form, developed for use throughout Canada. Nutrition knowledge was assessed on total points scored on nutrition knowledge questions.

Analysis of data shows that the girls have had opportunities for application of nutrition knowledge, even

though it appeared that mothers had the greatest influence on the choice of foods served in the home. Mothers also appeared to have greater influence on the dietary practices of control girls than research girls.

Contrary to expected results, control girls seemed to have better nutrition knowledge and better dietary practices, than research girls. These apparent differences were found to be not significant, but this also served to discount the hypothesis concerning superiority for the research girls.

It was therefore concluded that for the present study, the amount of exposure to nutrition instruction made no difference to the amount of nutrition knowledge, and also that nutrition knowledge was not necessarily manifested in dietary practices.

The observed data demonstrated that intervening variables might influence the transfer of nutrition knowledge to dietary practices. The attitude of research girls toward certain guiding nutrition principles was considered a prime factor involved in the observed results for those girls.

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INTRODUCTION

It has been widely acclaimed that nutrition is a very important and contributing factor to the health and development of individuals, or groups of individuals. On the basis of this fact, nutrition education programmes have been initiated for several population groups throughout the world. Some of these programmes may be temporary or emergency measures, but others are on a more permanent or continuing basis.

Because home economics is a part of the school curriculum in Manitoba, this represents one of the situations in which nutrition education is on a more permanent basis. In most school divisions, home economics classes are available to all girls in junior high school, and girls in senior high schools may select home economics as an optional subject.

Girls who attend home economics classes are instructed in nutrition principles and concepts for approximately 26 hours per week for 18-19 weeks in grade IX, and for approximately 32 hours per week for 18-19 weeks in grades XI and XII. This means that junior high school girls would have approximately 500 hours (about 20 days) of nutrition instruction. High school girls who take home economics would have approximately 600 hours of nutrition

instruction in grade XI. This would make a total of 1100 hours (about 45 days) of nutrition instruction for girls who take home economics to grade XI.

The idea that exposure to nutrition education leads to acquisition of nutrition knowledge, and subsequent application of that knowledge, seems to be the general opinion among people who are concerned with nutrition education. However whether or not nutrition education is manifested in practice, will depend on the related factors or intervening variables which may be in operation. These variables may appear in the interval between nutrition instruction and actual application of nutrition knowledge. On the other hand, intervening variables may be inherent to the groups or individuals.

For the present study, the problem selected was an investigation of the effect of nutrition education on dietary practices, when some intervening variables or related factors were taken into consideration. This study was concerned with a specific group of girls in a selected area.

Objectives of the Study

Specifically, the study was designed to examine what relationships exist between nutrition education and the dietary practices of two selected groups of grade XII girls from the Winnipeg School Division No. 1. One group,

referred to as the Research group, consisted of grade XII girls who had taken foods and nutrition in both senior and junior high school. The other group, referred to as the Control group, consisted of grade XII girls who had not taken home economics since grade IX. The groups were selected with a difference in the amount of exposure to nutrition instruction, in order to see if there was any difference between them with regard to the relationship between nutrition knowledge and practice.

The following assumptions from previous investigations of a similar nature, seem to support the premise concerning intervening variables and the transfer of knowledge. These assumptions were therefore assessed for their relevance to the present study.

Assumptions

1. The dietary practices of teenage girls are influenced by their knowledge of nutrition, and by the application of nutrition knowledge.
2. Teenage girls do not consistently apply their knowledge of nutrition to their dietary practices.
3. Teenage girls are known to skip meals, and in order to compensate, they develop the habit of snacking. These practices may be responsible for certain deficiencies in food intake.

4. Teenage girls tend to have dietary practices in accordance with family standards and practices. Therefore, the attitudes of mothers concerning nutrition, and the dietary practices of mothers, are likely to have some influence on the dietary practices of the girls.

Hypotheses

Consistent with the objectives of the study, the following hypotheses were formulated.

1. Girls who have had nutrition instruction in both junior and senior high school would have better knowledge of nutrition than girls who have had nutrition instruction in junior high school only.
2. Nutrition knowledge would be reflected in dietary practices, therefore greater exposure to nutrition knowledge would lead to better dietary practice.

Importance of the Study

This study was considered important because it concerns the nutrition of teenage girls. This group has been considered by some investigators as a somewhat vulnerable group, with regard to poor nutritional practices (Everson, 1960; Spindler et al., 1963; Trenholme et al.,

1963). One might speculate that the dietary practices of most teenagers are similar, regardless of regional differences, but this could only be an assumption, unless there was some investigation to verify the speculation.

Although nutrition education is made available to many teenage girls in Manitoba, yet no effort has been made to determine whether or not nutrition education has helped the girls to become less vulnerable to the poor nutritional practices which are often associated with many teenage girls. Such an investigation was considered necessary, particularly at this time, when the number of girls enrolled in home economics classes, and facilities for teaching home economics in the schools, seem to be on the increase.

According to the Manitoba Home Economics Newsletter (1971) for the 1970-1971 school year, there are 25,406 pupils enrolled in home economics. Over the past two years, 35 home economics laboratories were opened and staffed, and for the beginning of the next school year another 27 laboratories are expected to be ready. Not only are there more students and more laboratories, but there are 194 home economics teachers in 1971. This represents 100 more than there were in 1961.

Compared to the limiting circumstances under which home economics was taught in the earlier years (Wilson, 1969), home economics today is able to offer more to the

students involved; but even in the early days of home economics education in Manitoba, the very few teachers available are said to have stressed nutrition as their main objective. They believed that it was possible for a girl to get A on an examination and still be a failure in her eating habits. The concern regarding the nutritional practices of girls has therefore been in existence over the years; but it is not known definitely, what relationships exist between knowledge of nutrition, and the use of this knowledge in the daily lives of the girls.

The author felt justified in pursuing the present study because the results might have some implications for future nutrition education programmes in the schools. For instance, educators might want to do further studies with teenage girls in different areas to determine if trends observed in the present study could be generalized.

Limitations of the Study

There are certain limitations related to the present study which have to some extent influenced the findings of the study, or moreso, the implications of some of the findings of the study.

One obvious limitation is the size of the sample. On some questions, the small sample size did not permit analysis of some categories. In such cases, categories had to be collapsed and thus parts of variables did lose their

identity.

Another factor which was considered a limitation for this study, was the interval during which data was collected, particularly the 24-hour recall of food intake. It is possible, that if 24-hour recalls of food intake were taken on one specific day, or even on days within the same week, for all the girls, then the 24-hour recall would represent a more reliable assessment of the dietary intake on a single day.

As it was, some 24-hour recalls were taken in December, some in January and some in February. Variations in food availability, and in the activities of the girls were just two factors that might have affected dietary intakes at different times of the year.

It is true that according to the design of the study, and the process of selecting a matched group for control, it would not be possible to eliminate in the 24-hour recalls, the differences between research and control groups which could be attributed to the time of the year. However, if the recall period was the same for all the girls, one would be more likely to believe that any differences that appear within the groups, were caused by factors other than difference in the time of dietary recall.

REVIEW OF LITERATURE

There were no reports to indicate that the specific area of concern in the present study had been previously investigated. This review of literature was therefore concerned with problems which were considered to be closely related to the present investigation.

Several investigators in both the United States and Canada, have expressed concern about the dietary practices of teenagers, especially girls. The main concern was that teenage girls tend to have inadequate food intake. Foods such as milk, vegetables, cereal and fruits, were reported as low-intake food items for teenage girls (Everson, 1960; Warnick et al., 1963; Wharton, 1963; Trenholme, 1963; Armstrong, 1964; Porter, 1964; Weber, 1964; Dicks, 1966; Hampton et al., 1967; Department of Health, New Brunswick, 1961).

According to these reports, one would suspect that there were several factors or intervening variables which influence the dietary practices of teenagers. Some of these factors were reviewed on the basis that perhaps they would also influence the practice or lack of practice of nutrition knowledge among teenage girls.

Spindler et al. (1963) in their study of a group of 15-17 year old teenagers, tried to get from the teenagers,

some information concerning the attitudes and motivations involved in adolescent food habits. The teenagers admitted that they select what everyone else eats. One might take into consideration the thought that "everyone" for the teenagers was likely to be referring to peer group members. Teenagers in the group also said that food choices in favourite gathering spots were often poor. Girls said they avoided foods which they considered fattening, therefore intake of foods like milk, bread and cereals was low. Similar findings were reported by Brown (1967).

The findings of Trenholme et al. (1963) from their Ontario study, suggested that the prevalence of food fads directed towards slimness, appeared to be a major cause of improper food selection among teenage girls. Myers (1962) found that few adolescents ate foods which they knew promoted good health, if they did not like the foods.

Spindler et al. (1963) also found that many of the adolescents in her group expressed the opinion that parents and other adults should accept the responsibility of seeing that they (the adolescents) have adequate diets. However, Weber (1964) felt that when the teenage girl is involved in meal planning and preparation, she usually takes a greater interest in her own nutrition and the adequacy of her diet.

Other reasons cited by Spindler et al. as being responsible for poor food intake among teenagers are: time

schedules not coinciding with meal times, and the adolescents often being in too big a hurry to eat at all. These factors lead to meal-skipping, and subsequently, an inadequate food intake. Brown (1967) reported similar findings.

Students in Armstrong's (1964) study cited the following as reasons why they skip breakfast: lack of time, disliking some foods, no appetite, and the food not being prepared for them. Weber (1964) found that for teenagers in her study, breakfast was skipped most often, and dinner the least often.

Brown (1967) had college students look at the bases for their food habits. She learned from her subjects that the high school years are the years when students are on their own when it comes to eating habits; it is a period of experimentation in foods, and adventurous teenagers are eager to try many types of foods.

It has been established by some investigators (Myers, 1962; Wharton, 1963; Weber, 1964 and Dicks, 1966) that teenagers, especially girls are snackers. However, the reports of these investigators vary on the effects that snacking has on the dietary intake of teenagers.

Wharton (1963) reported that for some teenagers, snacks provided 20-30% of the total intake for all nutrients except vitamin A and ascorbic acid. Over 35% of the girls received more than 20% of their calories as snacks, and for

those who snacked there was slight improvement in the intake of protein, calcium, iron, thiamine, niacin and riboflavin.

Hinton (1963) found no relationship between the number of snacks and the adequacy of the diet, but suggested that snacks eaten do contribute to the daily food intake, even though many snacks are chosen by teenagers without consideration of the nutritive value. Myers (1962) observed that there was a great variety of snack food items for the teenagers she studied, but she found that very few of those items were highly nutritious.

Aside from factors such as meal skipping and snacking, which one may attribute to the personal attitudes and motivations of teenagers, there were other variables which were likely to have some effect on their dietary intake.

Some of these variables were:

1. Socio-economic factors such as income and education of parents, (especially mothers) and family size.
2. Parental influence especially that of mothers, and particularly in relation to their knowledge of nutrition, and the attitude and opinion of mothers.
3. Mother's occupation, specifically whether she did or did not work outside the home, coupled

with the extent to which teenage girls were involved in the selection and preparation of food in the home.

4. The influence of factors outside of the home on the teenage girl. For example, home economics classes and other variables which might influence nutrition knowledge and practice.

Socio-economic factors

Hendel et al. (1965) reported that socio-economic factors had some influence on children's diets. In her study, intakes of vitamin A and vitamin C, were found to be positively related to the major socio-economic factors of income, degree of urbanization, and the education of the mother, but inversely related to the number of children in the family.

Hinton (1963) found that girls with better diets tended to come from the highest of three socio-economic classifications, and girls with the poorer diets from the lowest of the three socio-economic classifications.

Epprawright et al. (1970) found that mothers education was more highly related than income, to the dietary component of children's meals. Trenholme et al. (1963) expressed the opinion that the poor food habits found among Ontario teenagers were not due primarily to economic factors.

Lyle (1959) reported that on the average, homemakers

from low socio-economic groups served citrus fruits, tomatoes and raw vegetables less often than homemakers in middle or high socio-economic groups. Also, cooked yellow and green vegetables were, on the average, served less often by homemakers in low socio-economic groups than by homemakers in other socio-economic groups.

Parental influence

It has been assumed that teenage girls practice food habits in accordance with family standards and practices (Dicks, 1966). More often than not, the homemaker seems to be the one who makes most of the decisions concerning what foods are served in the home, therefore, the homemakers knowledge of nutrition would ultimately influence to some extent, the food intake of the family, if not in quantity, then in quality.

Young et al. (1956) found from their study of two groups of suburban homemakers, that more than half of 156 homemakers had never heard of a balanced diet and could not define one. When asked what should be included in a family meal, practically all the homemakers mentioned conventional food patterns such as meat and potatoes, fruits or other vegetables.

Twenty to thirty percent of the homemakers in Young's (1956) study, gave evidence of meal planning on the basis of some real knowledge of the rudiments of nutrition,

but for one-third to one-half of the homemakers there was no evidence of any nutritional knowledge. Similar findings were reported by Lyle (1959). When homemakers were asked how they decided what to cook or plan for family meals, a very few reported the use of meal planning guides that might be based on sound nutritional facts. Only 8 of the women said they planned meals to include the Basic Seven Food Groups, and 128 said they tried to balance each meal.

In all, less than 25% of the group cited guides that could be interpreted as based on knowledge of nutrition. For most of the homemakers, serving what the family likes or using what was on hand, were the common guides for meal planning. Some homemakers, more often those in the low or middle socio-economic group, said they followed some type of meal pattern. They illustrated what they meant by citing such groupings as meat, vegetables, bread and dessert for dinner, and eggs, toast, or breakfast food and coffee for breakfast.

In Young's (1956) study, foods such as green leafy and yellow vegetables, and ascorbic acid-rich fruits, were mentioned by only about 15 or 10% respectively of the two groups of homemakers. For these foods to be included in meals, the homemakers would need to have a certain amount of nutrition knowledge in order to realize their importance. According to Eppright et al. (1970) nutrition knowledge

scores of the mothers of pre-school children were significantly related to the ascorbic acid, niacin, phosphorous, protein, riboflavin, calcium and caloric value of food consumed by the children.

Even though there was no guarantee that there would be similar findings for teenage subjects, there was the inference that if mothers knew what was nutritionally necessary and adequate, other factors being equal, they would provide nutritionally adequate meals for their families when they planned meals.

Eppright et al. (1970) found that mothers of children whose diets were classified in the lowest 10% with respect to nutritional quality, were the mothers who had a relatively low level of nutrition knowledge. It was also found that they were the mothers who had less favourable attitudes towards meal planning and food preparation. Generally, mothers with low levels of nutrition knowledge had a highly permissive attitude toward the eating behaviour of their children.

Working mothers

Hinton (1963), and Kelly (1968) reported that girls whose mothers were employed outside of the home had more responsibility for preparation of family meals than did other girls. Consequently, it would be expected that those girls with working mothers would have more influence

on their own dietary intake than other girls. Hinton also reported that girls who had the responsibility for planning meals usually had the responsibility for also buying food and preparing meals.

However, she also found that purchasing of food, and preparation of some food did not appear to be related to eating behaviour or dietary adequacy. Girls who planned meals consumed fewer snacks than those who did not plan meals, and when they prepared their own meals, the girls consumed a smaller number of snacks, had fewer servings of food per day, and tended to have poorer diets than others. This is contrary to Weber's (1964) findings that girls who are involved in meal preparation usually take more interest in their own nutrition and the adequacy of their diets.

The influence of factors outside the home

Teenagers are generally influenced in their behaviour by others outside the home. Specifically where food intake is concerned, teenagers will eat what peer group members think is fashionable to eat. However one important and influential factor on the dietary intake of teenagers, seems to be the school.

A group of college students in Brown's (1967) study, recalled that the school, through home economics classes or clubs, helped them to strengthen good food habits, and provided an awareness of food preparation and

standards. Home economics classes in schools are designed to contribute to students knowledge of nutrition, and some investigators have found positive relationships between nutrition knowledge and nutritional practices.

Hinton (1963) found that girls who scored higher on nutrition tests, missed fewer meals, and selected more adequate diets than other girls. However, Dicks (1966) found that academic ability may not always influence a person's food habits. She reported that some students on all ability levels had excellent, good, fair or poor food habits. Furthermore, Dwyer et al. (1970) after testing the nutritional literacy of 1337 high school students, came to the conclusion that the effects of nutrition education on nutrition knowledge was found to be less than expected.

Nevertheless, some investigators have found that nutrition education has had some influence on the dietary practices of teenagers. Whitehead (1960) reported the results of a three-year study of a group of 11-12 year old students. Half of the 264 students formed the research group, and was exposed to nutrition education. The other half was used as a control group.

A part of the research group had nutrition education for one year and the other part for two years. Data was collected before exposure to nutrition education, immediately after one year's nutrition education,

immediately after two years nutrition education, and 1 year post-nutrition education for both the 1 year and the 2 year groups.

According to initial data, research and control groups had the same basic eating patterns. After one year of nutrition education, research and control groups maintained their general eating patterns, but intakes from food groups for the research classes more nearly approached recommended amounts, than did intakes for the control classes. Scores for all classes in the two year group, were higher than for those in the one year group.

Although changes in dietary practices may be caused by many factors, it was concluded from the results of Whitehead's (1960) study that nutrition education programmes caused increases in the dietary scores of the research classes. These increases were considered as improvement in food choices. The results also suggested that two years of nutrition education were more effective than one year.

Teske (1967) studied the effects of nutrition education on 49 grade IX and 32 grade VIII girls. The girls were given a pretest, followed by one and two units of nutrition education for the grade VIII and grade IX girls respectively. At the end, the diets of the ninth grade girls showed improvement over those of the eighth grade girls, but still many food shortages were indicated

mostly in those foods which supply vitamin A, vitamin C and calcium.

In the pretest dietary recall, 51% of the total students were reported as having poor quality diets, only 13% had good diets, 36% had fair diets, and there were no excellent diets. At the final test, 52% of all the girls had excellent or good diets, 33% had fair diets, and only 15% had poor quality diets. These figures were said to indicate a decided improvement in the dietary habits of 85% of all the students who were exposed to nutrition education.

Of the grade IX group, 9% of the girls still had poor quality diets compared with 18% of the grade VIII girls. Since 36% of the grade IX girls had poor quality diets initially, the final test dietary recall showed an improvement of 27% for the grade IX girls. This seems to indicate that two units of nutrition education taught in succeeding semesters had more effect in improving the dietary practices of students than had one unit of nutrition education (Teske, 1967).

However, McKenzie et al. (1967) contended that true effectiveness of nutrition education should manifest itself in behaviour change not just immediately after nutrition education programmes but in long lasting behaviour change. McKenzie and associates conducted nutrition education programmes for 4600 British school children.

The purpose of the nutrition programmes was to persuade the children to take more school milk. The investigators found that although there appeared to be a small increase in the number of children that said they would take milk, there was no significant increase in the number that did take milk.

While it was possible that more milk was being consumed by the children at home than at school, it seemed unlikely to the investigators that there would be carryover of nutrition education to the home, while little or no effect was evidenced at school. McKenzie and associates thus concluded that nutrition education may not change eating behaviour, if there co-exist strong factors that militate against change.

This author tends to agree with McKenzie and associates. It seemed evident that any carryover of nutrition education to the dietary practices of teenage girls would be influenced by several co-existing factors. Some of the factors examined in this review of literature, were also examined in the present study.

METHODOLOGY

The nature of the study and the objectives of the study were the main factors which influenced decisions on methodology for the present study. However, for this study, like many others, money and time were two restricting factors. In fact, no research grant was available for the study, and this fact could not be ignored when decisions were made on methodology for the study.

The sample, its characteristics and selection, and the characteristics and administration of research instruments, were two of the main areas of concern. In addition, adequate attention was given to methods of retrieval and analysis of data.

A. The Sample

General characteristics

The final sample for the study consisted of 44 grade XII girls and 42 women. The women were the mothers or guardians of the girls in the sample. Two pairs of twin girls were included in the sample. This accounts for the fact that there were 44 girls and 42 women.

One-half of each group, 22 girls and 21 women, represented the research groups. The other halves represented the control groups.

Selection of the subjects

1. The schools.

Two schools in the Winnipeg School Division No. 1 were selected as sources from which the sample was drawn. The schools were recommended by the Supervisor of home economics for the School Division, mostly on the merit of the Foods and Nutrition programme, and teachers in the two schools. The following criteria were involved:

- (1) The teachers were rated "superior."
- (2) They were experienced teachers.
- (3) They were continuing teachers, that is, they had taught the girls in the sample in both junior and senior high school.
- (4) The schools had average-sized classes in Foods and Nutrition.

When the schools were suggested, contacts were made with the principals and home economics teachers of Foods and Nutrition to obtain their co-operation. The home economics supervisor for the school division made the first contacts.

Later, the Foods and Nutrition Department of the Faculty of Home Economics made further contacts. From these contacts assurance of co-operation from the principals and home economics teachers was received, and permission was given to conduct a study in the selected schools -- Grant Park High School and Churchill High School.

2. Selection of the students.

In each school, the research group was the first to be selected. The girls were informed of the study, and asked if they were willing to co-operate. Following indications of their intentions to participate, they were asked to furnish the names and occupation of parents in order to select girls of similar background for the control group.

When the mothers were interviewed additional background information on parents was acquired. This information was used to guide further selection of girls for the control group. Sampling for both groups was done in one school at a time.

The following variables were considered in order to match the students:

- (1) mother's occupation
- (2) mother's age
- (3) mother's educational level
- (4) father's educational level
- (5) father's occupation
- (6) family size
- (7) family income

Frequency matching was used to make the final selection of girls for the study. By this technique, pairs of subjects would have similarly distributed variables. Thus, for the variables listed above there were similar

distribution of subjects between the research and control groups. This method of matching was used for pragmatic reasons. Although it clearly lacked the rigor of paired matching, the "control" and "research" groups were fairly well matched on a number of variables.

Of all the variables that were used for matching, education level of mother and father, and the average number of children in the family, were the variables which showed the greatest similarity in frequency distribution for research and control groups. Income levels had similar distribution in some, but not all categories of income. Table 1 illustrates the background characteristics of the final sample. The two groups of girls differed mainly in that control girls had home economics in junior high school only, whereas, research girls had home economics in both junior and senior high school.

B. The Research Instruments

Questionnaires and interview schedules are research instruments found to be widely used in sociological studies. Since the development of nutrition research programmes, several investigators including Trenholme et al. (1963), and Weber (1964) have used questionnaires and/or interview schedules to obtain research data.

In the present study, both the questionnaire and

Table 1
Background Characteristics of the Sample

		No. of Mothers		
		Research	Control	Totals
<hr/>				
Mother's age:				
	30-45 years	13	8	21
	≥ 46 "	8	13	21
Education:				
Mother:	Elem. & J. High	2	2	4
	Sr. High	18	18	36
	University	1	1	2
Father:	Elem. & J. High	4	2	6
	Sr. High	11	12	23
	University	4	5	9
	*	2	2	4
Family Income:				
	1000-5000	3	4	7
	5000-9000	10	7	17
	> 9000	8	10	18
<hr/>				
Family Size:				
	Av. no. of children per family	2.7	2.4	
<hr/>				

* no father

the interview schedule were used. A 30-minute group-administered questionnaire was used for the girls. The questions were straightforward without any need for in-depth probing. Thus it was most economical to gather the data from the girls in this manner.

The data from the mothers was gathered through personal interviews. This permitted the interviewer to explain to the mothers any questions that required explanation, and also permitted some probing when it was felt necessary.

The Questionnaire

The questionnaire developed for this study included the following subject areas:

- (1) Food intake practices of the girls
- (2) The girls involvement in food selection, meal planning and preparations
- (3) The girls knowledge of nutrition
- (4) The girls estimation of their application of nutrition knowledge in their homes
- (5) The girls knowledge and practice of Canada's Food Guide
- (6) The girls estimation of their mothers feelings concerning Foods and Nutrition classes which they attend at school
- (7) Dietary history of the girls.

For this study, two modifications of the dietary history, as defined by Becker et al. (1960) were used. The first was a 24-hour recall of food intake, with estimates of quantity. The second was the current usual weekly intake of food groups, recorded by recall of estimates of quantity or frequency of occurrence.

These measures of food intake were used simultaneously, because it was felt that information gained from both sources would give a better picture of the actual current food intake of the girls. Canada's Food Guide's suggested intake of food groups was used as a guide in developing questions on food intake.

The adequacy of the methods used in obtaining and assessing dietary intake has often been a controversial subject among nutritionists. Investigators such as Young et al. (1952), Trulson (1959) and Balogh et al. (1971) have compared methods of obtaining dietary intake data. The opinion seemed to be that each method has its advantages and disadvantages, and the use of a particular method would depend on the population group, and how the data was analysed and interpreted.

The nutrition knowledge questions included in the questionnaire were based on areas of study, prescribed textbooks and suggested references from grade XI Foods and Nutrition programme as designated by the Department of

Education for the Province of Manitoba. (Appendix 1.)

The Interview Schedule

An interview schedule was used to gather information on dietary and other practices of the mothers, dietary practices and involvement of the girls in meal preparations, as seen by the mothers. The interview also provided information on family characteristics of the girls. Inclusion in the interview of items similar to those in the questionnaire provided opportunity for comparison of responses given by mother and daughter.

Development and Administration of the Research Instruments

Both the questionnaire and the interview schedule were developed with regard to the objectives of the study, and some basic assumptions made in other studies. At various stages of development both instruments were evaluated by grade XII girls outside of the survey area, fellow graduate students, staff members in the Department of Foods and Nutrition, and some members of the advisory committee for the study. After modifications, the research instruments were ready for pretesting.

Pretesting

Pretesting was done at St. John's High School. This school was suggested as a possible source for sample selection, but since only 7 girls were taking the Foods and

Nutrition option, the decision was made to use this school for pretesting. During pretest, the planned process of collecting the data was carried out as follows:

- (1) The 24-hour recall forms (Appendix 2) were distributed to and completed by girls in the research group.
- (2) At a later date the girls completed self-administered questionnaires.
- (3) Appointments were made, and mothers were interviewed.

This concluded data-gathering for the research group. The same steps were followed for the control group. Comments and questions from girls and mothers during pretest, were found useful in reformulating questions on both questionnaire and interview schedule.

On the basis of pretest assessment both the questionnaire and the interview schedule were revised, and the final copies (Appendix 3 and Appendix 4) were ready for administration in December 1970. The pretest plan was followed. Research and control groups from Grant Park High School were surveyed in December 1970, and January 1971. The groups from Churchill High School were surveyed in February and March of 1971.

C. The Data

Classification and Retrieval

The final data was obtained from 22 matched pairs of girls and 21 matched pairs of mothers. To retrieve information given on questionnaires and interview schedules, some responses to questions were coded according to pre-determined standards, and the coded data was transferred to cards for computer analysis.

Food intake records were scored according to the system used in the Nutrition Division's Food Habits Survey form (Appendix 5). The system used Canada's Food Guide (Appendix 6) as a standard for intake of 5 food groups--milk, fruit, vegetables, cereals and bread, meat and meat-substitutes.

Nutrition knowledge questions were scored as test items and then coded. Maximum points were scored for all correct answers, and the scores decreased accordingly as the number of correct answers decreased. Scores on knowledge of Canada's Food Guide were assigned in a similar manner.

Other responses, arising mostly from probe questions, were analysed for trends based on frequency distribution, and for discovery of unsuspected variables which might be operating to bring about certain results. Because the present study was an exploratory one, analysis

of probe responses and open-ended questions was considered an important step.

Analysis of data was expected to yield indications of relationships which might exist between nutrition education of the girls, and their dietary practices. However, findings were expressed only in terms of the groups studied.

RESULTS

Data from the Girls

Many of the girls (72.7% research and 86.4% control) said that they enjoy most foods. However, only 45.5% research and 31.8% control girls said that they "get to eat the foods that they like." For 72.1% research and 31.8% control girls, the meat group was the favourite food group. Fruits were favourites for 18.2% research and 40.9% control girls. None of the girls in either group selected vegetables as favourites.

Estimated Weekly Intake

Green leafy and yellow vegetables were included in the food intake of almost all girls in both groups. Citrus fruits or juices were also included. Vegetables, cereal, and milk were the food groups eaten the least often by both research and control girls. Table 2 shows the percentage distribution of girls who met 50% or more of Canada's Food Guide's recommended intake of fruit, meat, vegetables and milk, on their estimated weekly intake.

In addition to drinking milk as part of a regular meal or snack, 59.1% research and 72.7% control girls had from 1-6 servings of milk pudding or other milk dishes for a week. A small percentage of girls (9.1%) in both groups

Table 2

Percentage distribution of girls meeting $\geq 50\%$ of
Canada's Food Guide's recommended intake,
on their estimated weekly intake

Food Group	Research	Control
	%	%
Fruits	54.5	68.2
Vegetables (-Potatoes)	31.8	32.7
Meat	86.4	72.7
* Milk ₁	45.5	22.7
** Milk ₂	13.6	50.0

n = 22

* Milk₁ is 25% or less of recommended intake

** Milk₂ is 75% or more of recommended intake

Note: Milk calculation is explained in later discussion

did not take milk in any form.

The bread and cereal group was not scored partly because Canada's Food Guide did not specify the amount of bread. Also, for the present study, the bread and cereal group was made to include cake and other baked products. It was felt that these products could not be adequately assessed by the modified form of the standard scoring system used in this study (Appendix 5).

Cereal was never eaten by 68.2% research and 36.4% control girls. Over 90% of the girls in both groups had less than 7 servings of cereal for the week. Approximately 50% of the girls in each group had 1-6 servings of cookies and other baked products in a week. The others had more

than 7 servings for the week.

24-hour recall

The standard scoring form (Appendix 5) was modified to include a "poor" category. This modified form was used to score the 24-hour recall of food intake for the girls. According to this scoring system, the majority of the girls in both groups had 24-hour food intakes classified as fair.

Twice as many control as research girls, had 24-hour food intakes classified as good. Over 3 times as many research as control girls, had food intakes classified poor. There were no very good intakes in the control group, and only a small percentage (4.5%) in the research group. Table 3 gives a summary of the distribution of food intake classifications on the 24-hour recall.

Table 3

Percentage distribution on food intake classifications
for 24-hour recall of food intake

Classifications	Scores	Research	Control
		%	%
Very good	>85	4.5	0.0
Good	70-84	18.2	36.4
* Fair	55-69	45.5	54.5
* Poor	<55	31.8	9.1

n = 22

* Modified version of standard form (Appendix 5)

The 24-hour recall of food intake was typical for 59.1% research and 86.4% control girls. Table 4 gives percentage distribution of girls meeting 50% or more of Canada's Food Guide's recommended intake for the 5 food groups. On all 5 food groups more control than research girls met 50% or more of the recommended intake.

Table 4

Percentage distribution of girls meeting $\geq 50\%$ of
Canada's Food Guide's recommended intake,
on the 24-hour recall

Food Group	Research	Control
	%	%
Fruits	68.1	72.7
Vegetables	77.3	90.9
Bread and cereals	68.1	72.7
Meat	95.5	100.0
Milk	40.9	53.1

n = 22

Meal skipping

Table 5 summarizes the percentage distribution on meal skipping patterns; 54.5% research and 68.2% control girls said that they skip meals. According to the findings (Table 5), there were more research than control girls who did not skip morning or noon meals; but there were more research than control girls who skipped evening meals.

The four most frequently given reasons for skipping meals were:

Table 5
Percentage distribution on meal skipping patterns

No. of meals skipped	Meal	Research	Control
		%	%
none/wk	morning	50.0	40.9
	noon	72.9	63.6
	evening	63.6	95.5
1-3/wk	morning	27.3	31.8
	noon	27.3	27.3
	evening	36.3	4.5
4-7/wk	morning	22.7	27.3
	noon	0.0	0.0
	evening	0.0	0.0

n = 12 research; n = 15 control

- Do not feel like eating (59.1% research, 50% control)
- Always in too much of a hurry (50% research, 45.5% control)
- Meal times clash with other activities (27.3% research, 31.8% control)
- Never eat breakfast (18.2% research, 9.1% control)

Meals away from home

A slightly higher percentage (81.8%) of research than control girls (77.3%) ate meals away from home. This did not include meals made at home and eaten elsewhere. Table 6 summarizes the distribution on meals eaten away from home.

Table 6
Percentage distribution on total meals eaten
away from home

No. of meals	Research	Control
	%	%
None/wk	18.3	22.7
1-3/wk	22.7	54.6
4-7/wk	40.9	22.7
>7/wk	18.1	0.0

n = 18 research; n = 17 control

According to breakdown on individual meals, twice as many control (77.7%) as research girls (36.4%) ate no evening meals away from home. Very few girls in either group, ate morning meals away from home, and more control than research girls ate noon meals away from home.

Snacking

The most popular times for snacking were after the evening meal (59.1% research and 40.9% control) and before the evening meal (40.9% research and 18.2% control); 100% research and 95.5% control girls ate snacks.

The most usual snack items indicated were milk, apple, cookies, coffee or tea, chips, orange, sandwich and candies. Table 7 gives the percentage distribution on the more popular snack items. Hamburgers, raisins, doughnuts, hot dogs, milk-shake and ice cream were indicated among the

Table 7
Percentage distribution for the more popular
snack items

Snack item	Research	Control
	%	%
Apple	72.7	68.2
Milk	68.2	63.6
Orange	63.6	45.5
Cookies	54.5	81.8
Coffee or tea	54.5	40.9
Candies	31.8	13.6
Chips	27.3	31.8
Sandwich	27.3	4.5

n = 22

less popular snack items.

Canada's Food Guide

Very few girls in the research group, indicated that they follow Canada's Food Guide; 72.7% research and 54.5% control girls said they did not follow the guide. The girls in the control group gave the following reasons:

- Do not know or remember it
- Do not make the meals
- Do not like some of the foods on it
- Cannot always have what it recommends
- Financial position does not allow us to follow it.

The girls in the research group had other reasons for not following Canada's Good Guide. The following were the most usual comments:

- Do not feel I need to
- Not too concerned about it
- Do not make a habit of following rules about what to eat
- Usually get everything I need without following it
- Getting along fine without it
- We usually eat the right amounts anyway
- Don't have one, but mother and I usually know what is good for the family and what is not
- I know whether or not I am eating the right foods
- Cannot be bothered, believe I eat well-balanced meals anyway.

For all food groups, except bread and cereal, and meat, over 50% of the girls in each group knew what Canada's Food Guide recommends for the teenager. Table 8 gives the frequency distribution on the knowledge of Canada's Food Guide's recommended intake for the teenager.

Nutrition knowledge

Total scores on nutrition knowledge questions, showed 50% research and 45.5% control girls with a score of 66% or less of the maximum score of 46. Table 9 gives the frequency distribution on nutrition knowledge scores.

More research than control girls were able to identify 2 or more of 3 nutrients that are most essential

Table 8

Percentage distribution of knowledge of
Canada's Food Guide's recommendations
for the teenager

Food Group	Research	Control
	%	%
Milk	54.5	63.6
Fruits	50.0	54.5
Potatoes	86.4	86.4
Other vegetables	68.2	72.7
Bread and cereals	68.2	9.1
Meat and meat sub- stitutes	36.4	18.2

n = 22

Table 9

Percentage distribution of nutrition knowledge scores

Scores	Research	Control	
	%	%	
16-20	18.2	0.0	≤ 66% of total of 46
21-25	18.2	22.7	
26-30	13.6	22.7	
31-35	36.4	31.9	> 66% of total of 46
36-40	9.1	18.2	
41-45	4.5	4.5	
> 45	0.0	0.0	

n = 22

mean = 28.5 research; mean = 30.8 control

during pregnancy, and the two best sources of vitamin C; but more control than research girls were able to identify 2 or more of 4 best sources of protein, and the two best sources of vitamin A.

Sources of nutrition information

For both research and control girls, home economics classes and mother, were the two most influential sources of nutrition information. Table 10 summarizes the ratings as nutrition information sources.

Table 10
Percentage distribution on sources of nutrition
information

Source and position	Research	Control
	%	%
Mother as No. 1	31.8	45.2*
as No. 2	22.7	9.1*
H. ec. as No. 1	59.1	36.4**
as No. 2	22.7	22.7***

* n = 12; ** n = 18; *** n = 13

More research than control girls selected home economics classes as their number one source of nutrition information. More control than research girls selected mother as the number one source of nutrition information.

Mothers' feelings concerning school nutrition classes

When the girls speculated about their mothers feelings concerning school nutrition classes, 18.2% research and 22.7% control said that they thought their mothers were interested in what was being taught in school nutrition classes, and would like to know more about it; 45.5% research and 50% control girls, thought their mothers would like to see them practise more of what was taught in school concerning nutrition.

Involvement in the home

On school, as well as non-school days, the girls seemed involved in meal preparations. Table 11 illustrates the pattern of involvement in meal preparations, by family members, on school and non-school days.

Although some girls were not entirely responsible for preparing meals, 95.5% of both research and control girls helped others with preparations. Table 12 gives the frequency distribution on involvement in meal planning and preparations.

The most frequently given reason for any lack of involvement in meal planning and preparations, was being too busy (40.9% research, 54.5% control); 36.3% research and 13.6% control stated that mothers feel that they can prepare meals faster and more economically than the girls. Some girls felt their help was not needed or appreciated (13.6%

Table 11

Meal preparations on school and non-school days

Who prepares	Meal	Research		Control	
		sch. day %	non-sch. day %	sch. day %	non-sch. day %
Mother	a.m.	45.5	45.5	31.8	13.6
	noon	45.5	31.8	50.0	13.6
	p.m.	40.9	40.9	81.9	63.6
Self	a.m.	31.8	27.3	50.0	50.0
	noon	22.7	36.4	22.7	50.0
	p.m.	18.2	--	4.5	--
Mother and self	a.m.	--	--	--	4.5
	noon	4.5	9.1	18.2	9.1
	p.m.	18.2	5.0	4.5	13.6
Each his own	a.m.	18.2	27.3	18.2	22.7
	noon	9.1	18.2	4.5	27.3
	p.m.	--	4.5	4.5	18.2
Other	a.m.	4.5	--	--	4.5
	noon	18.2	4.5	4.5	--
	p.m.	22.7	4.5	4.5	4.5

Table 12

Percentage distribution on involvement in meal planning and preparation

Activity	No. of subjects	Frequency	Research	Control
			%	%
Help to plan meals	20*	1-2 times/dy/wk	27.3	9.1
	18**	Few times/wk	40.9	40.9
		1-2 times/mth	22.7	31.8
Help to prepare meals	20*	1-2 times/dy/wk	63.6	36.4
	21**	Few times/wk	0.0	13.6
		1-2 times/mth	27.3	45.5
Fully responsible for preparing meals	19*	1-2 times/dy/wk	9.1	0.0
	20**	Few times/wk	22.7	22.7
		1-2 times/mth	54.5	68.2
Responsible for planning and preparing meals	18*	1-2 times/dy/wk	9.1	0.0
	19**	Few times/wk	9.1	27.3
		1-2 times/mth	63.6	59.1

* n = research; ** n = control

research and 27.3% control); 22.7% of the girls in each group preferred meals that were prepared by someone else.

The following are some other reasons specified by the girls. Some girls with jobs were not at home for meal times (36.4% research and 22.7% control); others were at school or were fulfilling some other obligations and therefore could not help at home. For some girls, mothers had the meals ready by the time they got home.

Even if girls failed to participate in meal planning and preparations, many girls discussed foods and nutrition with their mothers; 77.2% research and 68.2% control girls, usually or sometimes have discussions; 77.2% research and 73.6% control girls, felt that the ideas they gave during these discussions, were usually or sometimes used. Both discussion and the use of ideas were more often on the "sometimes" than "usual" basis.

Recipes suggested by 50% research and 45.5% control girls were often used; 9.1% research and 18.2% control girls said that their recipes were usually used. For 36.4% research and 27.3% control, the recipes they suggested were seldom used; 40.9% research and 36.4% control girls felt that their nutrition knowledge would be most effective in the home, in the area of menu planning for nutritionally balanced meals.

Selection and serving of foods on the basis of

aesthetic value was the area in which 45.5% research and 31.8% control girls thought they would be most useful. Only 9.1% research and 13.6% control girls felt that they would be most useful in cooking food to conserve nutrients.

(Mothers rated the girls similarly on these three aspects of their use of nutrition knowledge in the home.)

For 54.5% research and 77.3% control girls, mothers had the most influence on the choice of foods served in the home. Fathers had the most influence for 31.8% research and 9.1% control. None of the girls in either group thought that they had most influence on the choice of foods served in the home.

The decision on the choice of foods to purchase for the home was made by the mothers of 50% research and 45.5% control girls. (Mothers gave similar indications.) Father and mother made the decision for 18.2% research and 27.3% control girls; 22.7% research and 27.3% control girls said the decision was made by their mothers and themselves. None of the girls in either group, made the decision by themselves. (Same response from mothers.)

Some girls helped their mothers in shopping for food, but only a small percentage in both groups were involved in shopping by themselves for food. Mothers were mostly responsible for the shopping for both research and control groups.

Decision time for meals varied with the meals. The evening meal seemed to be the most important meal. The most usual time for deciding on the evening meal was a day ahead. The girls explained that enough time was needed to make preparations for that meal. (Mothers had similar data on decision time for meals.)

Data from Mothers

Estimated weekly intake

Mothers in both research and control groups met 50% or more of Canada's Food Guide's suggested intake for 3 of 4 food groups. The milk group showed low intake for both groups of mothers. Table 13 gives the findings on 4 food groups.

Table 13

Percentage distribution of mothers meeting $\geq 50\%$ of
Canada's Food Guide's recommended intake,
on their estimated weekly intake

Food Group	Research	Control
	%	%
Fruits	19.0	71.4
Vegetables (-Potatoes)	90.5	95.5
Milk	28.5	14.3
Meat	100.0	100.0

n = 21

Cereal was never eaten by 57.1% research and 52.4% control mothers; 95.2% research and 85.7% control mothers estimated that they had less than 7 servings of cereal for the week; 47.6% research and 33.3% control mothers, estimated that they had less than 7 servings of cookies and other baked products in a week.

Milk was not included in the regular meals or snacks of 38.1% research and 52.4% control mothers; but 95.5% research and 85.7% control mothers included milk in coffee, tea, and other beverages. On the whole, more control than research mothers had low milk intake on the estimated weekly food intake.

24-hour recall

According to the scoring form used in this study, more research than control mothers had 24-hour food intakes classified good, and more control than research mothers had 24-hour food intakes classified poor. Fair intakes were found among a similar percentage of research and control mothers. Table 14 gives the findings on food intake classifications.

For 85.7% research and 71.4% control, the food intake recorded was of a typical day. Table 15 gives the findings on a breakdown of the 24-hour food intake into food groups.

Meat was the favourite food group for 81% research

Table 14

Percentage distribution on food intake classifications
for 24-hour recall of food intake

Classifications	Scores	Research	Control
		%	%
Very good	> 85	4.8	0.0
Good	70-84	33.3	23.8
* Fair	55-69	38.1	33.3
* Poor	< 55	23.8	42.9

n = 21

* Modifications of the standard scoring form (Appendix 5)

Table 15

Percentage distribution of mothers meeting $\geq 50\%$ of
Canada's Food Guide's recommended intake,
on 24-hour recall

Food group	Research	Control
	%	%
Fruits	85.8	61.9
Vegetables	90.4	95.2
Bread and cereals	80.9	61.9
Meat	100.0	100.0
Milk	52.3	57.2

n = 21

and 90% control mothers. The cereal group, including cakes and pastry, was noted as eaten the least often by most of the mothers in both groups.

Meal planning practices

Some form of meal planning guide was used by 81% research and 76.2% control mothers. Only a small percentage of mothers in each group used Canada's Food Guide (9.5% research and 4.8% control). The majority of mothers (42.9% research and 47.6% control) planned on having variety in the meals. This includes meat, vegetables and sometimes dessert and milk. A few of the mothers (4.8% research and 14.3% control) were guided by the favourite meals of the family.

Some mothers (14.3% research) depended on weekly shopping in sales; other mothers (9.5% research) were guided by what they consider nutritious foods. In both research and control groups, 14.3% of the mothers did not follow any kind of a guide in meal planning. These mothers said they operate on a whatever-is-available basis. Mothers' reports on when they decide on meals were very similar to those of the girls.

Other findings

Generally, mothers said that they have most influence on the choice of foods served in the home (52.4%

research, 42.9% control); 33.3% research and 28.6% control mothers said that their husbands have the most influence. Only a small percentage of mothers (4.8% research and 9.5% control) said that their daughters have most influence. (None of the girls thought they had any influence.)

Some mothers discussed foods and nutrition with their daughters (90.5% research and 81% control); 47.6% research and 52.4% control mothers, said that they discussed the subject occasionally; 42.9% research and 28.6% control discussed the subject usually or sometimes. (According to data from the girls, more girls than mothers estimated that discussion of foods and nutrition takes place.)

In both research and control groups 71.4% of the mothers said that their daughters gave them ideas about foods and nutrition. Of these mothers, approximately 81% of each group said that they usually or sometimes used the ideas they get from their daughters. A small percentage of both control and research mothers, said their daughters have given them ideas on how to conserve nutrients in meat and vegetables when they cook them.

A higher percentage (81%) of research than control mothers (52.4%) reported that they usually get help from their daughters in meal preparations; 57.1% research and 38.1% control mothers reported that their daughters would plan, cook and serve meals. In both groups, 38.1% of the

mothers said that their daughters would only cook and serve meals. A small percentage of mothers in both research and control groups, stated that they received no help from their daughters.

A small percentage of mothers (4.8% research, 19% control) stated that they received about the same amount of help from their daughters in senior high school and junior high school. Mothers who received more help during the junior high school period (23.3% research and 38.1% control), believed that the novelty of home economics at that time was partly responsible for the help their daughters gave them. Also, the girls had more time in junior high school. Whereas during senior high school, jobs kept some girls away from home, and others were involved in athletic and other activities and therefore had no time to help out at home.

Some mothers, 71.4% research and 42.9% control, said they received more help from their daughters during the senior high school period. They felt that their daughters helped more at this stage because they were more competent, and working mothers especially relied more on their daughters at this time.

Concerning the statement that nutrition education would influence dietary practices, mothers were asked to express their opinions on this statement with regard to their daughters; 61.9% research and 66.7% control mothers

were in agreement with the statement, 38.1% research and 33.3% control disagreed. The following were some of the reasons given for agreeing or disagreeing with the statement.

Some mothers agreed because they observed that their daughters had become more aware of nutrients in different foods, and they ate accordingly. Girls seemed to care more about what they ate, and chose foods more wisely. According to some mothers, home economics education improved the eating habits of some girls, and for some, home economics education reinforced good eating habits which they had been trying to instil in their daughters. Some girls started eating breakfast, and some started to include vegetables in their food intake.

Some mothers disagreed with the statement because they observed no change in the dietary practices of their daughters. Some mothers reported that their daughters were still eating what they wanted to eat; some still had poor eating habits, for example, missing breakfast. One girl was reported as going on a starvation diet after she started taking home economics. For some mothers their daughters were still the worse eaters in the family. In many cases, the mothers believed that their daughters already had good dietary practices, so the need for change did not exist.

In order to determine whether or not the girls

nutrition education had influenced others, mothers were asked if their dietary practices had been affected by their daughters taking nutrition education at school; 33.3% research and 14.3% control thought their dietary practices had been influenced by nutrition education passed on to them by their daughters. The main influences were in reducing the intake of fattening foods, and in including vegetables other than potatoes in their meals.

The dietary practices of 57.1% research and 61.1% control mothers had not been influenced by their daughters participation in school nutrition education programmes; some mothers claimed they already had good dietary practices. A few of these mothers attributed their good dietary practices to their own home economics education; 23.8% control and 9.5% research mothers did not know whether or not their dietary practices had been affected by their daughters nutrition education programmes.

Nutrition was reported as being quite, or very important in meal planning for 95.2% research and 90.2% control mothers; 4.8% research and 9.5% of the control mothers felt that nutrition was fairly important in meal planning. None of the mothers thought it was not important. The idea that good nutrition is important for health and well-being was the reason most frequently given for the responses.

In both research and control groups, 90.5% of the mothers had scores between 75 and 100% of the maximum score of 20; 19% research and 14.3% control mothers had full score on nutrition knowledge questions.

More control than research mothers reported having taken part in classes such as health, cooking, home economics, which could furnish them with nutrition information. For the research group, the three main sources of nutrition information were books and magazines, their mother, and their teenage daughter. For the control group, books and magazines, mother and home economics classes were the main sources of nutrition information; 71.4% research and 47.6% control mothers stated that some of the books and magazines they used, belonged to their teenage daughters.

Twice as many (66.7%) research as control mothers stated that their daughters provided them with some knowledge of foods and nutrition. Table 16 gives the percentage distribution and order of importance of the three most important sources of foods and nutrition for the mothers in the study.

Although slightly over 50% of the mothers in the research group and 33.3% of the control mothers chose teenage daughters as their third best source of nutrition information, only a very few mothers in both groups, selected their daughters as first or second source of

Table 16

Percentage distribution on some sources of nutrition information

Source position	n	Group	Source			
			Mother %	Home ec. %	Bks. and mag. %	Daughter %
No. 1	21	Research	28.6	14.3	52.4	--
	21	Control	38.1	19.0	38.1	4.8
No. 2	14	Research	23.8	4.8	19.0	19.0
	15	Control	14.3	23.8	33.3	--
No. 3	13	Research	4.8	--	--	52.4
	13	Control	4.8	--	23.8	33.3

nutrition information.

Almost all the mothers in both groups expressed satisfaction with the home economics education their daughters have had; 61.9% research and 38% control mothers indicated that they were interested in what their daughters have learned in nutrition classes, and would like to know more about it. (A smaller percentage of girls predicted that their mothers would give this response.) 42.9% research and 23.8% control mothers would like to see their daughters practise more of what they have learned in nutrition classes. (Similar percentage of research girls selected this as the response their mothers would give. More control girls predicted this response.)

Some mothers (28.6% research and 61.9% control) said that they have visited home economics departments in high school; 76.2% research and 61.9% control stated that they would be interested in visiting school home economics departments on a once a year basis. Of the mothers who did not express the desire to visit schools, some stated that for them time was a limiting factor. More research than control mothers reported having jobs outside the home. Of the 61.9% research and 52.4% control mothers employed away from home, 52.4% of the research, but only 28.6% control mothers were employed full time.

Interrelationship of Data

Some general findings based on frequency distributions have been reported. Because the dietary intake of the girls was considered the dependent variable, the data was examined to see how, or if dietary intake was related to other variables.

The dietary intake (dependent variable) of the girls has been represented in this study by their estimated weekly, and 24-hour recall of food intake. For the purpose of analysis for relationships between dependent and independent variables, only the estimated weekly intake was used as dependent variable, because it was based on usual pattern of food consumption. The 24-hour recall of food intake was omitted because for some of the subjects, it was not a typical day's intake.

For the purpose of analysis, estimated weekly intake was divided into 2 categories. The first consists of all subjects with estimated food intake scores which met 50% or less of Canada's Food Guide's recommended intake for four of five food groups. The second category consists of all subjects whose scores met over 50% of Canada's Food Guide's recommended intake for the food groups.

A Questionnaire and Chi-Square Program (Reimer, 1970) was used to cross-tabulate the dependent variable (estimated weekly intake) and the following independent

variables:

Variables:

- Girls scores on knowledge of Canada's Food Guide
- Girls use of Canada's Food Guide
- Girls nutrition knowledge scores
- Frequency of application of nutrition knowledge
- Meal skipping
- Home economics and mother as sources of nutrition information
- Mothers use of meal planning guides
- Mothers nutrition knowledge scores
- Mothers scores on estimated weekly intake
- Mothers estimation of the importance of nutrition in meal planning
- Who had most influence on foods served in the home
- Mothers occupation
- Family income.

Tables 17 to 22 give the findings on cross-tabulated variables.

Correlation of variables

A simple correlation program (Chebib, 1970) was used to further determine relationships between variables. Table 23 shows the results of intercorrelation between the

following 8 variables, for the "research" group, and Table 24 shows the results for the "control" group.

Variables - m = 8

- | | |
|-------------------------------------|-----------|
| 1. Estimated weekly intake | (girls) |
| 2. 24-hour recall | (girls) |
| 3. Total meals skipped | (girls) |
| 4. Total meals eaten away from home | (girls) |
| 5. Nutrition knowledge | (girls) |
| 6. Estimated weekly intake | (mothers) |
| 7. 24-hour recall | (mothers) |
| 8. Nutrition knowledge | (mothers) |

Differences between groups

Paired students t-test program (Chebib et al., 1970) was used as a test for significant differences between groups, on 3 variables. Table 25 gives the results.

Paired students t-test program (Chebib et al., 1970) was also used to test for differences between research and control mothers. On all 3 variables--estimated weekly food intake, 24-hour recall of food intake, and nutrition knowledge, no significant differences were found between the two groups of mothers.

Table 17

Relationship between girls estimated weekly food intake,
nutrition knowledge, and Canada's Food Guide

Rec. wkly. intake	Group	CFG score		Follow CFG		Nutrition knowledge score	
		≤ 3	> 3	Yes	No	$\leq 66\%$	$> 66\%$
$\leq 50\%$	Research	3	5	0	8	4	4
	Control	2	2	1	4	5	0
$> 50\%$	Research	6	8	5	9	7	7
	Control	9	9	9	8	5	12

Table 18

Relationship between girls estimated weekly food intake, application of nutrition knowledge, and sources influencing nutrition knowledge

Rec. wkly. intake	Group	Appl. of knowledge		Sources of influence			
		Usually and often	Seldom	Mother 1	H.Ec. 1	Mother 2	H.Ec. 2 *
≤ 50%	Research	4	4	2	5	2	2
	Control	0	5	2	2	0	0
> 50%	Research	5	9	5	8	3	3
	Control	11	6	8	6	2	5

* 1 = no. 1, or most important source of influence

* 2 = no. 2, or next in importance

Table 19

Relationship between girls estimated weekly food intake,
meal skipping, and family income

Rec. wkly. intake	Group	Skip meals		Family income in \$		
		Yes	No	1000-5000	>5000-9000	>9000
≤ 50%	Research	7	1	1	5	2
	Control	4	1	1	1	3
> 50%	Research	5	9	2	6	6
	Control	11	6	3	7	7

Table 20

Relationship between girls estimated weekly food intake,
and mothers meal planning practices

Rec. wkly. intake	Group	Guide		What guide		
		Yes	No	Variety	Shopping and favourite meals	Nut. knowledge and CFG
≤ 50%	Research	4	4	1	0	3
	Control	3	2	2	1	0
> 50%	Research	13	1	8	4	1
	Control	14	3	8	3	1

Table 21

Relationship between girls estimated weekly food intake, mothers nutrition knowledge, the importance of nutrition in meal planning, and who has most influence on the choice of foods served

Rec. wkly. intake	Group	Nut. knowledge		Impt. of Nut.		Most influence	
		≤ 66%	> 66%	Very impt.	Quite and F. impt.	Mother	Father
≤ 50%	Research	2	6	8	0	3	2
	Control	1	4	2	3	2	1
> 50%	Research	4	10	11	3	9	5
	Control	6	11	13	4	8	5

Table 22

Relationship between girlseestimated weekly food intake, mothers
occupation, and mothers estimated weekly food intake

Rec. wkly. intake	Group	Occupation			Mothers est.wkly. intake	
		Full time work	Part-time work	House- wife	$\leq 50\%$	$> 50\%$
$\leq 50\%$	Research	4	1	3	3	5
	Control	2	1	2	3	2
$> 50\%$	Research	8	1	5	2	12
	Control	4	5	8	2	15

Table 23

Simple correlation coefficients for intercorrelation of 8 variables
"research" group

Variable	1	2	3	4	5	6	7	8
1	1.0000000							
2	0.4535559	0.9999998						
3	-0.4229551	-0.3951174	1.0000000					
4	0.0716876	0.1186076	0.0732868	1.0000000				
5	0.0952134	0.4333506	-0.5521995	-0.0959265	1.0000000			
6	0.0609499	-0.1281873	-0.3103174	0.0998520	0.2257834	1.0000000		
7	0.2286402	0.1513612	-0.1371298	-0.0565200	0.2986488	0.3302611	1.0000000	
8	-0.0533098	0.2143261	0.0848208	0.0514671	0.3815534	0.2045938	0.3468693	1.0000000

m = 8; n = 22; critical value = .4227

1 Estimated weekly intake (girls)
 2 24-hour recall (girls)
 3 Total meals skipped (girls)
 4 Total meals eaten away from home (girls)

5 Nutrition knowledge (girls)
 6 Estimated weekly intake (mothers)
 7 24-hour recall (mothers)
 8 Nutrition knowledge (mothers)

Table 24

Simple correlation coefficients for intercorrelation of 8 variables
"control" group

Variable	1	2	3	4	5	6	7	8
1	1.0000000							
2	0.5175130	1.0000000						
3	-0.1929963	-0.5767227	1.0000000					
4	-0.1577154	-0.1159459	-0.0139175	1.0000000				
5	0.6042911	0.2352740	-0.0186100	-0.0961640	1.0000000			
6	0.5394784	0.2535371	-0.1032946	0.2806816	0.0980524	1.0000000		
7	0.4966157	0.1642154	-0.0936321	-0.0817431	0.1603151	0.3360223	1.0000000	
8	0.0334465	-0.2458661	-0.1321633	0.1799100	-0.0761362	0.3037150	0.0853460	1.0000000

m = 8; n = 22; critical value = .4227

1	Estimated weekly intake	(girls)	5	Nutrition knowledge	(girls)
2	24-hour recall	(girls)	6	Estimated weekly intake	(mothers)
3	Total meals skipped	(girls)	7	24-hour recall	(mothers)
4	Total meals eaten away from home	(girls)	8	Nutrition knowledge	(mothers)

Table 25

Paired t-test on 3 variables: estimated weekly
food intake, 24-hour recall of food intake,
and nutrition knowledge

Variable: 1 = estimated weekly intake
2 = 24-hour recall
3 = nutrition knowledge
n = 22; X_1 = research; X_2 = control

Variable	\bar{X} of X_1	\bar{X} of X_2	$\bar{X}_1 - \bar{X}_2$	S_d	SE
1	43.9091	46.6818	-2.7727	15.9819	3.4074
2	59.1818	65.2273	-6.0455	20.1553	4.2971
3	28.5909	30.8182	-2.2273	10.0044	2.1330

For each variable, $H_0: \bar{X}_1 - \bar{X}_2 = 0$

For variable 1. $T = 2.080 - 5\% \quad 2.831 - 1\%$
 $T = -0.8137$ with 21 df * ns

For variable 2. $T = 2.080 - 5\% \quad 2.831 - 1\%$
 $T = -1.4069$ with 21 df * ns

For variable 3. $T = 2.080 - 5\% \quad 2.831 - 1\%$
 $T = -1.0442$ with 21 df * ns

* ns = not significant

INTERPRETATION AND DISCUSSION OF DATA

According to data from both the girls and their mothers, it would appear that the girls surveyed, have had some opportunity to put their nutrition knowledge into practice. Even though mothers were shown to have most influence on the choice of foods purchased for, and served in the homes, both the girls and their mothers reported that they discussed foods and nutrition together. Discussions were more usual for research than control group. The girls, as well as their mothers stated that during discussions, ideas on foods and nutrition were passed on to mothers by their daughters. Some of these ideas were sometimes if not usually used.

More research than control mothers were reported to work full time, and many of these mothers reported that they relied on their daughters for help with meal preparations. Data from mothers as well as daughters, indicated that the evening meal was considered the important meal of the day. More plans were made for this meal, and more research than control girls joined their mothers in preparation of evening meals on non-school days.

These findings would indicate that the research girls were very much involved in areas of foods and nutrition, and one would conclude that they have had opportunities

to utilize knowledge obtained from foods and nutrition classes.

On the subject of nutrition knowledge, reported data (Table 9) showed that the mean nutrition knowledge scores, for both research and control girls, constituted approximately 60% of the maximum score. This leads one to believe that the girls had acquired some knowledge of nutrition from their exposure to nutrition education in home economics classes, or from other sources.

The focal point of all activities which related to the utilization of the girls nutrition knowledge was the relationship that existed between nutrition knowledge and the personal dietary practices of the girls. It was established that they did have nutrition knowledge, and it was reported that they passed on some ideas of nutrition to their mothers, but did they use these ideas personally?

In response to the question of whether or not nutrition education had influenced the dietary practices of their daughters, some mothers agreed. Some disagreed because they observed dietary practices among the girls, which were inconsistent with nutrition education. Meal skipping and starvation diets were two examples. Findings reported in data from the girls, strengthened the opinion given by some mothers. For instance, 54.5% research and 68.2% control girls, stated that they skip meals. One

research girl estimated that she skipped as many as 11 meals for a week.

Warnick et al. (1963) stated that meal skipping leads to deficient dietary intake. Findings in the present study could support this idea, particularly when it was observed that 36.3% of the research girls skip 1-3 evening meals for the week (Table 5). This could be detrimental to dietary intake, since the evening meal seemed to be the best-planned meal of the day.

Some girls reported eating meals away from home. In the research group 40.9% of the girls ate 4-7 meals away from home (Table 6). On the 24-hour recall of food intake for example, 40.9% research, 23.6% control said the food intake was not a typical one. Two frequently occurring reasons were that they were downtown, or went to work. They had no time and so "grabbed" a quick snack. Some girls explained that they excluded certain food items from these snacks. Vegetables were reported to be the most commonly excluded food items on such occasions. If this was a frequent occurrence, then the findings that snacks fail to compensate for meals skipped (Warnick et al., 1963) could well be relevant to some girls in the present study.

However, the snacking habits of the girls (100% research and 95.5% control) need not be altogether unfavourable for them. According to the choice of snack items

(Table 7) snacking might well be contributing to their dietary intake, thus supporting Hinton's (1963) findings, but disagreeing with those of Myers (1962) that few snack items are nutritious. However, since most of the girls reported that they snacked most often before or after the evening meal, there might be some implication here that snacking interfered with the desire or necessity to eat the evening meal.

On the relationship between meal skipping and snacking, the girls of greatest concern would be the ones who skipped morning meals (Table 5). For the majority of the girls in both research and control groups, early and mid-morning were the times they snacked the least often. So if girls missed morning meals and did not snack, their first meal for the day was at noon.

One convenient means by which the girls could apply nutrition knowledge to practice, would be to know and follow Canada's Food Guide. In Table 8, it is shown that except for 2 food groups (only 1 for research group) over 50% of the girls in each group know what Canada's Food Guide recommends for the teenager. However, reported data has shown that 72.7% research and 54.5% control girls did not follow Canada's Food Guide.

On looking at the reasons previously cited by the girls for not following Canada's Food Guide, the impression

was that the research girls deliberately ignored the guide and its implications. The attitude that these girls seemed to have towards Canada's Food Guide might well be related to the observed data on their dietary intake.

On the 24-hour recall of food intake, there were more fair and poor diets, than good, or very good, especially for research girls (Table 3). The control girls appeared to have better food intake than the research girls. According to Table 4, milk seemed to be the one food group with a low level of intake. Considering that 45.5% of both research and control girls stated that they had food items from the bread and cereal group the least often, one would expect this group to be a low-intake one. The difference observed was mostly attributed to the bread used in sandwiches and otherwise. Also, according to the scoring system, butter was scored in the bread and cereal group.

Fruits were not very popular with the girls, especially those in the research group. Only 18.2% research compared with 40.9% control girls selected fruits as their favourite food group. However, on the 24-hour recall of food intake, a fair percentage of the girls in both groups met 50% or more of Canada's Food Guide's recommended intake for fruit. Fruit intake was probably boosted by the recorded intake of Japanese oranges, plentiful during the survey period. Apples, also plentiful, were recorded quite

frequently, especially as snack items.

Compared with the mothers' 24-hour recall of food intake (Table 14), research girls did not have generally as good food intakes as their mothers, but control girls had generally better food intakes than their mothers. It was a typical day's food intake for 59.1% research girls, 86.4% control girls, 85.7% research mothers, and 71.4% control mothers. Since the recall days were 4 different days, no valid comparison could be made.

On the estimated weekly intake of fruits, vegetables, meat, and milk, more control than research girls met 50% or more of Canada's Food Guide's recommended intake (Table 2). In both groups, a relatively small percentage of the girls met 50% or more of the recommended intake for vegetables.

Milk was scored at the 25% and 75% levels, because the code representing the 50% level was omitted from the questionnaire. The difference between the 75% level of intake and the 25% level could roughly estimate the percentage of girls who met 50% of the recommended intake but, on looking at the data without any extrapolations, the control girls seemed to have better standing on milk intake (Table 2). Milk is a low-intake item for the mothers as well (Table 13). It could be that this was one instance where the girls were influenced by family patterns.

The low intakes of milk and vegetables observed in data for this study, supported similar findings by other investigators (Warnick et al., 1963; Weber, 1964; Armstrong, 1964). The reasons were similar too. Some girls stated that they did not like vegetables, and some did not like milk. Others considered milk a fattening food; but perhaps the girls did have more milk than they thought they had because in addition to milk intake as part of regular meals or snacks, 59% research and 72.7% control girls estimated that they had between 1 and 6 servings of milk puddings or other milk-containing dishes per week.

The low intake of milk in meals or snacks might also be responsible for low intake of cereal. Some girls and some mothers reported that they did not like milk, and since cereal required milk, they did not have cereal either. Other girls stated that they regarded cereal as a breakfast food. It seemed clear then, that girls who never eat breakfast, or who skip breakfast frequently, would not have had cereal as part of their food intake. Some girls said they avoided the bread and cereal group because those food items were considered fattening. This latter finding agreed with similar findings by Trenholme et al. (1963), Spindler (1963), and Brown (1967).

Observation and interpretation of data for this study seemed to reveal a lack in the practice of nutrition

knowledge by some girls in some instances related to their dietary practices. Actually, this should not be surprising, since other investigators reported that teenage girls did not always practice good nutrition.

One preconceived idea in terms of this study, was that nutrition education and its relationship to the practice of nutrition could be affected by other factors or intervening variables. Some of these factors were indicated in some basic assumptions arising from other studies. These assumptions were examined to see if the factors they include were really in operation for the present study.

Assumptions

1. The dietary practices of teenage girls are influenced by their knowledge of nutrition, and by the application of nutrition knowledge.

A cursory look at the data discussed would dismiss the assumption that nutrition knowledge has influenced dietary practice. It did not seem true for this study. However, on further examination of the data, a certain trend towards a relationship between nutrition knowledge and dietary intake was seen.

This trend was true in the case of the control but not research girls. This was in conflict with other theories regarding the expected difference between the two

groups of girls; but the fact that a trend seemed to exist was not discounted even though it existed for the control group only. Table 17 shows that girls with higher scores on nutrition knowledge also had better estimated weekly intake.

Intercorrelation of variables for the control girls (Table 24), also revealed positive correlation between nutrition knowledge and estimated weekly intake, but no significant correlation between nutrition knowledge and the 24-hour food intake. For the research girls, there was no significant correlation between nutrition knowledge and estimated weekly intake; but there was positive correlation between nutrition knowledge and the 24-hour recall, and between nutrition knowledge and total meals skipped (Table 23).

The latter part of the first assumption, states that the dietary practices of teenage girls are influenced by the application of nutrition knowledge. The knowledge and use of Canada's Food Guide was suggested (in earlier discussion) as one means by which nutrition knowledge could be practised. According to Table 17, research girls with better knowledge of Canada's Food Guide had better estimated weekly intake. This relationship was reversed for the control girls. From these observations, the only relationship that could be claimed was a slight one between

estimated weekly food intake and knowledge of Canada's Food Guide, for part of a group.

In both groups, more girls who did not follow Canada's Food Guide had lower estimated weekly intake, than girls who followed the Food Guide. In the research group the inverse relationship did not hold true for girls with better intake, but it did for the control group. One might therefore say that there was the tendency for a positive relationship to exist between practice of Canada's Food Guide and dietary intake.

More control girls who usually applied their knowledge of foods and nutrition, had better estimated weekly intake, than those who seldom applied their nutrition knowledge (Table 18). This relationship was not observed for the research girls.

Altogether, it could be said that there was data from the study to support the assumption that nutrition knowledge and its application, had some influence on the dietary practices of teenage girls. This support for the assumption was on the basis of the observed relationships discussed.

2. The second assumption states that teenage girls do not consistently apply their knowledge of nutrition to their dietary practices.

Data to support this assumption has been discussed. It was observed that many teenage girls skipped meals; and a high percentage of research girls did not follow Canada's Food Guide, even though they seemed to have knowledge of it. On the 24-hour recall of food intake, the high percentage of poor food intakes also supported this assumption.

According to the girls own report on the application of nutrition knowledge at home, fewer girls applied their nutrition knowledge often or usually, than those who seldom did so. On the basis of earlier discussions concerning meals eaten away from home, some girls also did not apply their nutrition knowledge when they were away from home.

3. The third assumption states that teenage girls are known to skip meals, and in order to compensate, they develop the habit of snacking. These practices may be responsible for certain deficiencies in food intake.

This assumption was also supported by data already discussed. Meal skipping was observed among the girls, but more frequently for the research girls who have had consistently lower ratings on food intake than the control girls.

Intercorrelation of data (Table 23) shows negative correlation between estimated weekly intake and meal skipping for the research girls. In other words, the girls who

skipped fewer meals were the ones with better food intake. This relationship was also observed from cross-tabulation (Table 19). For the control group there was no significant correlation between estimated weekly intake and meal skipping (Table 24), but there was negative correlation between 24-hour food intake and meal skipping. No significant correlation between these two variables was observed for the research group (Table 23).

As discussed earlier, snacking was indeed a habit with the girls in the present study, but the habit did not necessarily have adverse effects on food intake. Some girls did admit that they omitted vegetables when they had snack-type meals. However, some of these snack-type meals probably contained important food items.

It was noticeable that hamburgers, and hot dogs were listed among the less favoured snack items selected by the girls. Perhaps they were not chosen as snack items because they were considered as meal type items, and were probably eaten during one of those snack-type meals described by the girls.

On the basis of these interpretations, some data from this study supported the assumption concerning meal skipping, but there was not enough evidence to determine the true relationship between meal skipping and snacking.

4. The final assumption is that girls tend to

have dietary practices in accordance with family standards and practices. Therefore, the attitudes of mothers concerning nutrition, and the dietary practices of mothers are likely to have some influence on the dietary practices of the girls.

It has already been established that mothers had most influence on the choice of foods purchased and served in the homes. Therefore, they would definitely have had some influence on the foods the girls eat, provided the girls had meals at home.

The estimated weekly, and 24-hour food intakes of control mothers were positively correlated with the estimated weekly intake of the control girls, but not with their 24-hour food intake (Table 24). Table 22 shows similar relationships on estimated weekly intake for control girls.

There was no significant correlation between estimated weekly intake of research mothers and research girls (Table 23). Table 21 shows a positive relationship between mothers influence on the choice of foods served, and the estimated weekly intake of some girls. This was true for girls with better estimated weekly intake, but not for those with lower intake.

For the control girls, those with better dietary

intake had mothers who believed that nutrition was very or quite important in meal planning. These findings were similar for research girls with better dietary intake, but not for those with lower intakes. Nutrition knowledge of mothers was not significantly correlated with dietary intake of girls in either group (Tables 23 and 24).

However, the girls whose mothers had higher level of nutrition knowledge, were the girls with higher ratings on food intake (Table 21). Similar findings were reported by Eppright (1970). When mothers used some kind of meal planning guide, more girls had better food intake (Table 20). Because most mothers used variety in meals, as a guide for planning meals, the distribution for other types of guides was relatively small because of a small sample size. It was therefore difficult to assess the true relationship between the types of meal planning guides, and dietary intake.

The influence of mothers occupation on dietary practices, varied with the group. For the research girls, more girls who had better food intake, had mothers who work full time. This probably resulted from the fact that more research mothers relied on their daughters for help in meal preparations, especially the evening meals.

The girls with full time working mothers, who were shown to have better food intake, were probably those girls who prepared meals at home and ate more meals at home.

Weber (1964) reported similar findings. Although there was no conclusive evidence to this premise in the present study, the possibility should not be discounted.

Control girls had better food intake if their mothers were full-time housewives (Table 22). This seemed to be in keeping with earlier reported findings that more control than research girls selected mothers as their most influential source of nutrition information. Also, full-time housewives were in a better position to exert their influence. This was probably why control girls missed fewer meals than research girls, especially evening meals.

Family income did not seem to have any definite relationship to dietary intake of the girls (Table 19). Trenholme et al. (1963) also reported similar findings for her Ontario study. The foregoing variables discussed in connection with the influence of mothers on dietary practices of girls, have given some support to the assumption, that girls have dietary practices in accordance with family patterns.

However, there was some evidence from data in this study, which suggested that family influence was not always in effect. Girls were kept away from home for various reasons, and in such situations, family patterns and standards were not always practised.

On several aspects of the reported data, differences

between research and control groups were observed. Most of the differences were in favour of the control girls. They seemed to have better dietary intake, and better knowledge of nutrition. These observations were in contrast to expectations since the research girls have had more exposure to nutrition education in school than the control girls.

Furthermore, more research than control girls selected home economics classes as their most influential source of nutrition information. These apparent differences between the two groups of girls were assessed when the hypotheses for the study were tested.

First hypothesis

Girls who have had foods and nutrition instruction in both junior and senior high school would have better knowledge of nutrition than girls who have had nutrition instruction in junior high school only.

According to this hypothesis, the research girls should have better nutrition knowledge than the control girls, but the opposite seemed true according to observed data (Table 9). A paired t-test program (Chebib et al., 1970) was used to test the difference between nutrition knowledge scores for the two groups of girls. No significant difference was observed at the 5% and 1% levels of significance (Table 25 - 3).

This means that the length of exposure to nutrition education made no significant difference to the amount of nutrition knowledge for the girls in this study. If there was a significant difference, it would have been in favour of the control and not the research girls.

Second hypothesis

Nutrition knowledge would be reflected in dietary practices, therefore greater exposure to nutrition knowledge would lead to better dietary practices.

This hypothesis suggested that the research girls would have better dietary practices than the control girls. Evidence from data indicated that this was not so. Paired t-tests on estimated weekly intake scores and on 24-hour recall scores (Table 25 - 1 and 2) revealed no significant difference between research and control girls, at the 5% and 1% levels of significance. Again, if the differences were significant, they would have been in favour of the control group.

Both of these measures of food intake were subjective accounts. For the estimated weekly food intake, personal estimations were involved, therefore such hazards as exaggeration or underestimation were possible. However, since the entire survey group recorded weekly food intakes that were based on estimations, mean scores used for the

t-tests were considered to be relatively representative of each group.

The 24-hour recall of food intake was more representative of actual food intake, but this too might have been influenced by subjective appraisal of actual intake. Again, average scores should have eliminated or lessened such implications. Although subjects were asked to indicate whether or not the food intake was a typical one, the responses were not allowed to have too much influence when the data was analysed, considering that it was possible for typical day's food intake to be listed as non-typical only because of the subject's awareness of its being a food intake survey record.

The "Food Habits Survey" form (Appendix 5) was modified for use in the present study, because it was observed that of the three categories of diets ("very good," "good," and "fair") indicated in the form, the fair category had a very wide range. All diet scores under 80 for adolescents and under 70 for adults were classified as fair. Therefore, only diets between 80 and 100 for adolescents and 70 and 100 for adults, were classified in any meaningful way.

In some cases, this meant that only a very few subjects in a survey such as the present one, had meaningful assessment of their food intake. The majority were lumped

together as cases of "fair" intake. When individual scores were examined, it became obvious that there should have been a difference in diet classification between an individual with a score of 33 for example, and another with a score of 69 or 79.

According to the system used in the "Food Habits Survey" form (Appendix 5) the maximum score for teenagers was 110 points and for adults 100 points. The extra 10 points for teenagers was given for vitamin D intake. The relevance of the vitamin D intake score to some survey groups at the present time, was questionable, because some food items have been vitaminized to include vitamin D.

For the present study, the maximum score was based on the 20 points per food group assessed, and not on the maximum of 110 points. Another questionable point with regard to the use of Canada's Food Guide as a standard for food intake classification, was that in the bread and cereal group, there was no specification on the amount of bread. What are the implications if an individual eats an unlimited amount of bread in addition to the recommended intake of the other 4 food groups?

For want of a more effective method of assessing food intake, Canada's Food Guide was used as a standard for this study, but the author has reservations about its use as an effective measure of food intake.

SUMMARY AND CONCLUSIONS

Two groups of grade XII girls and their mothers were surveyed in order to determine what relationships exist between nutrition knowledge obtained particularly from home economics classes, and the dietary practices of the girls. The amount of exposure to nutrition education was considered the main difference between research and control groups because the girls were matched on several variables related to family background.

Data collected by means of questionnaire and interview schedule included dietary intake, scores on nutrition knowledge, and estimation of scope for involvement in application of nutrition knowledge by the girls. Dietary intake was assessed according to a modified form of the Nutrition Division's "Food Habits Survey" form (Appendix 5). Nutrition knowledge was assessed on the basis of total points scored on nutrition knowledge questions.

It was hypothesized that the research girls would have better nutrition knowledge than the control girls, because of greater exposure to nutrition education by the former group. It was also hypothesized that nutrition knowledge would manifest itself in the dietary practices of the girls, particularly their food intake. Since the research girls were expected to have nutrition knowledge superior to

that of control girls, they were also expected to have better dietary intakes than control girls.

Data from the survey group (girls and mothers) was analysed to determine whether or not any of the assumptions from similar studies were really in operation for the present study. Findings from the data suggested that some of the basic assumptions did seem to be relevant to the groups in the present study. For instance, the data did support the premise that meal skipping has some influence on dietary intake, and that teenage girls did not consistently apply knowledge of nutrition to dietary practices.

The data did not entirely support the assumption that the dietary practices of teenagers are influenced by their knowledge of nutrition, even though there was a slight trend towards this for the control girls; but the data did show that there was some positive relationship between the application of nutrition knowledge and dietary intake.

Especially for the control girls, the reported findings supported the assumption that teenage girls tend to have dietary practices in accordance with family standards and practices. Significant positive correlations were observed between the estimated weekly food intake of control girls and the estimated weekly, and 24-hour food intakes of their mothers.

These relationships were not observed for the

research girls but the data did show a positive relationship between the influence of research mothers on the choice of food and the estimated weekly food intake of some research girls. There was no significant difference in the nutrition knowledge of research and control mothers, but research mothers appeared to have less influence on their daughters dietary practices than control mothers.

According to reported data, control girls appeared to have better nutrition knowledge, and better dietary practices, than research girls, but tests for differences between the two groups revealed no significant differences between them on either of these two variables. These findings discounted the hypotheses that research girls would have better nutrition knowledge and better dietary practices because of their greater exposure to nutrition education.

It was of interest to note that the majority of research girls selected home economics classes as their most influential source of nutrition information, whereas most control girls selected mothers. Mean scores on nutrition knowledge questions were fairly similar for both groups.

Since it was hardly likely that the mothers of the control girls had much effect on the nutrition knowledge scores of their daughters, one tended to believe that the junior high school nutrition programme had some far-reaching effects on the girls.

It seems then, that the research girls should have been doubly affected by nutrition instruction from both junior and senior high school, but data disproved this theory. It is the opinion of the author that the attitude of the research girls definitely influenced their dietary practices. Their comments concerning the use of Canada's Food Guide tend to support this opinion.

Perhaps the reported attitude was based upon the fact that they have had a long period of exposure to home economics education, and have become tired of the subject by grade XII, and possibly because the girls are aware of some basic nutrition principles and concepts, they have started to feel that they have enough nutrition knowledge to start experimenting with their dietary practices.

On the other hand, apparent superiority of the control girls on nutrition knowledge, could be due to the fact that many of the intelligent girls in high school have had to forego the home economics option in order to take other courses. Since these girls usually have high intellectual ability, this is likely to be reflected in knowledge of a variety of subjects.

Some of the research girls were girls from the Occupational Entrance classes, and usually these girls have lower intellectual ability than girls who do not take the home economics option in high school. These are some of the

factors that future investigators might wish to take into consideration.

RECOMMENDATIONS

On the basis of the observed results of the present study, and the implications of these results, the author would like to make the following suggestions.

1. Important nutrition concepts and principles, which are vital to the personal health and development of teenage girls, will affect more girls if they are made available at the grade IX level. From the performance of the control group in the present study, it seems obvious that junior high school home economics has far-reaching effects.
2. Based on the attitude of the research girls towards Canada's Food Guide, it might be important for educators to think about other methods of guiding girls in food intake for better nutrition. It is not being suggested that Canada's Food Guide be discarded, but the fact that some girls seem to feel it is unrealistic to them should not be discounted.
3. The present study included only a small sample of high school girls. The author is suggesting

that similar studies be done with larger samples of high school girls in various areas, to see if the results of the present study are generalized.

4. It is strongly recommended that nutrition educators at all levels in the province of Manitoba collaborate in the development of an effective standard for assessing food intake. This standard should be one that is simple to apply and adaptable to different population groups.

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APPENDICES

APPENDIX 1

Foods and Nutrition 200

Home Economics Option Grade XI

Province of Manitoba

Department of Education 1968

FOODS AND NUTRITION 200

Teacher Reference:

Ruth Griswold: The Experimental Study of Food, Houghton Mifflin, 1962.

Stevenson and Miller: Foods and Nutrition, General Publishing Co.

Foods which are nutritionally and aesthetically satisfying and are eaten with enjoyment contribute to the good health and happiness of the family.

The principles of meal planning, organization of preparation, table setting, service and etiquette should be emphasized throughout the following units of study.

Content

Suggestions and References

UNIT I NUTRITION KNOWLEDGE

Coordinate Unit I - Nutrition Knowledge
with Unit II - Principles and Practice
of Food Management and Preparation

A. Protein Foods

1. Use of protein in the body:
 - a. For body maintenance.
 - b. In pregnancy and lactation.
 - c. During adolescence.
 - d. Normal requirements.
 - e. Results of deficiencies.
2. Composition of protein.
3. Classification and sources of protein foods.
4. Preparation of protein foods: certain skills are essential for the preparation of protein foods to preserve nutritive value and palatability.
 - a. Treatment of egg foams.
 - b. Treatment of tender cuts of meat.
 - c. Treatment of less tender cuts of meat.
 - d. Treatment of protein foods with little connective tissue.
 - e. Treatment of other protein foods.
 - f. Treatment of incomplete protein foods.

Pretest for nutrition knowledge.

See Canada's Dietary Standards.
Review Canada's Food Guide regarding desirable intake under varying conditions of age and growth.

Characteristics of a good product should be recognized.

E.g. souffles, chiffon cakes, sponge cakes, meringues,
broiling, barbecuing, roasting of pork, lamb, veal and beef,
braising, pot roasting, stewing of pork, lamb, veal and beef.

Fish

Poultry, eggs, cheese and milk.

Beans, peas, lentils, baked, soup, etc.

FOODS AND NUTRITION 200

Content

Suggestions and References

Energy Foods

1. Importance of Carbohydrates and Fats to the body:

Pretest.

- a. Source of heat and energy.
- b. The calorie as a measure of heat.
- c. Normal requirements.
- d. Conditions of abnormal intake.

Obesity, diabetes mellitus.

2. a. Composition of carbohydrates
- starches
- sugars
- sugar substitutes

- b. Composition of fats
- unsaturated
- saturated

Examine the physical properties of:
- solid fats
- liquid fats

3. a. Source of carbohydrates in food.
b. Sources of fat in food.

Starches, sugars, smaller amounts in many foods such as vegetables, fruits. Butter, cream, milk, margarine, cooking oil, meat, fish, poultry, eggs, cheese.

4. Preparation of energy foods:

- a. Emulsifying fats.
- b. Scientific principles governing preparation of flour mixtures.
- c. Scientific principles governing sugar cookery.

Salad dressings, cream puffs.

Emphasis on creativity and advanced preparation such as yeast breads, pastry, cakes, more filling desserts.

Boiled frostings, candy, discuss crystalization.

Mineral Foods

1. Functions and sources of mineral elements:

Pretest.

- a. Calcium and phosphorous: rigid structure of the body - clotting of blood, osmotic pressure.

Food Sources (a) milk, cheese, fruits, vegetables, fish, eggs, etc. (b) without milk, calcium and phosphorous needed.

FOODS AND NUTRITION 200

Content

- b. Iron and copper
haemoglobin

- c. Iodine and fluorine.

2. Preparation of foods to
conserve minerals:

Minerals dissolve in water.

D. Vitamin Foods

Use Alphabetical and Chemical
names of vitamins.

1. Functions and sources of fat
soluble vitamins:

- a. Functions.
b. Sources.

2. Functions and sources of
water soluble vitamins:

- a. Functions.
b. Sources.

3. Preparation of foods to
conserve vitamins:

- a. Vitamins dissolved in
water, effects of time
and temperature.
b. Vitamin loss through
exposure to air.

E. Water and Nutrition

1. Body needs.
2. Effects on nutritive value of
food.

Suggestions and References

Deficiency results in anaemia - how
to use iron efficiently in the body.
Food sources: liver, meat, eggs,
vegetables, whole-grain, cereals,
dried fruits, green leafy vegetables.

Deficiency disease - goitre, dental
caries. Food sources: (a) add
iodine to salt, (b) add fluorine
to water.

(a) use little water, e.g. methods
of cooking vegetables, (b) serve
cooking water, e.g. sauces, soups,
gravies.

Pretest for nutrition knowledge.

See Food and Textiles Volume 2.

Deficiency results in night blind-
ness, rickets.

Food sources: in natural fats, added
to foods.

Deficiencies result in suboptimal
health: pellagra, beri-beri, scurvy,
pernicious anaemia.

Food sources: in natural foods, added
to foods.

Vegetables - use little water, boil-
ing water, shortest time.

Salads and fruit plates - control
exposure.

Daily requirement under varying
circumstances.

Food sources: foods high in water
content.

ODS AND NUTRITION 200

Content

Suggestions and References

Special Nutritional Needs

- | | |
|-----------------------------|--|
| 1. Children. | Needs for protein, calories,
particular minerals, vitamins. |
| 2. Adolescents. | |
| 3. Pregnancy and lactation. | |
| 4. Over and underweight. | Desirable food patterns. |
| 5. Nutritional anaemia. | |
| 6. Dental health. | Test for nutrition knowledge. |
| 7. Older people. | |

IT II PRINCIPLES AND PRACTICE OF FOOD MANAGEMENT AND PREPARATION

Generalization:

Meals which are nutritionally and aesthetically satisfying and are eaten with enjoyment contribute to the good health and happiness of the family. Food must be eaten to give nutrition; it must be attractive and tasty to be eaten.

Content

Suggestions and References

Management of Resources for Meals

The planning, preparing and serving, of food can be done with greater ease and efficiency if the routine tasks are performed according to a plan designed for repeated use.

- | | |
|---|--|
| 1. Factors which affect the choice of food. | Income, available foods, season, prices, time for preparation, equipment in the home, family customs, likes and dislikes, etc. Many of the above, along with available time, energy, preparation skill of family members affect the menu plan. |
| 2. Factors which affect the menu plan. | |

FOODS AND NUTRITION 200

Content

3. Factors which affect the palatability of food.
4. Work planning.
5. Work simplification.

The above principles should be emphasized throughout the following units of study. Plan a complete meal around the dish or dishes actually prepared in laboratory.

3. Dinners

1. Patterns:

Consider nutritional adequacy, and palatability.

2. Meats - Pork, Lamb, Veal and Beef, nutritive value, characteristics, selection:

- a. Treatment of tender and less tender cuts.
- b. Method of preparation influenced by amount of connective tissue.

Suggestions and References

Appearance, colour, texture, flavour, attitudes of acceptance and pleasure, a wide variety of foods, preparation methods, seasonings, etc. Review use and location of utensils, make work plans, including clean-up and storage - establish individual responsibilities in group work. Apply techniques such as:

- a. Setting up a well arranged work space.
- b. Keeping work space orderly.
- c. Using both hands.
- d. Using the right utensils.
- e. Using a tray.
- f. Combining trips to central storage areas.
- g. Eliminating unnecessary tasks.

Coordinate with Unit I - NUTRITION KNOWLEDGE.

Customary and alternative patterns:

- a. Meat, potatoes, second vegetable.
- b. Add salad.
- c. Subtract second vegetable and salad.
- d. One-dish meal.
- e. Potato alternatives.

Pretest for knowledge of meat cookery. See Canadian Cook Book - Chapters 1 and 5.

At least one moist and one dry heat method should be employed at a more advanced level of cookery. Try some "specialty meat" recipes, use of tin foil, etc. Study interesting menus in good cook books.

FOODS AND NUTRITION 200

Content

Suggestions and References

3. Poultry - nutritive value, selection and care, kinds and grades of poultry, principles of cooking.
4. Fish - protein with little connective tissue, selection, care and principles of cooking.
5. Vegetables - number of servings per pound, nutritive value, preservation of food value and flavour.

Preparation: broiling, roasting, frying pies or stew.

Review market forms of fish, fresh, frozen, canned, smoked, salted preparation: lean fish, fat fish, shell fish.

Review methods of cooking vegetables, fresh, frozen, canned, fried, dehydrated and freeze-dried. Prepare less common vegetables in a variety of ways.

Luncheons and Suppers

1. Eggs - their nutritive value, characteristics at stages of freshness, grading and uses - treatment of egg foams.
2. Cheese - nutritive values - methods of production, varieties, characteristics of types, uses.
3. Salads - types of salads, variety of food combinations handling of greens, salad dressings.

Souffles, salad dressings, meringues, chiffon, sponge and angel food cakes.

Hot sandwiches, appetizers, sauces, main dishes, accompaniments.

Jellied salads, salad plates.

Desserts

Emphasis should be on creativity and, wherever possible, advance preparation. There is a trend to light desserts as the population is less active physically and increasingly aware of obesity as a health problem.

APPENDIX 2

24-hour Food Intake Record Sheet

On this Food Intake Record sheet, please record what you have eaten in the last 24 hours.

N.B. Be sure to include all snacks, and if you had nothing for the meals indicated, please write nothing. Estimate where you can, the amounts eaten e.g. 3 oz. hamburger or 1/4 cup beef stew, etc.

When you have completed the Record, please answer the question at the end.

Be sure to include your Name, School, Day of the week on which you are filling out the record, and the Date.

24 Hour Food Intake Record

NAME:.....Day.....Date.....

Meal

Food Items and Quantities

Morning meal

Snack

Noon Meal

Snack

(P) If not eating

at the time of the survey

or if you are eating something

elsewhere

APPENDIX 3

Student Questionnaire

APPENDIX 3

Student Questionnaire

Name _____

School _____

Date _____

In order to keep your answers to this questionnaire personal and confidential, your questionnaire will be given a code number and your name and school removed.

Please be sure to answer all the questions.

Thank you for your co-operation.

Code No. _____

1.

This questionnaire is aimed at obtaining information which will increase our knowledge of the food practices of teenage girls, and their comprehension and application of nutrition knowledge and concepts.

Please answer the questions as accurately as possible.

Please answer all the questions. Start at No.1 and work towards the end.

Unless otherwise stated, please indicate your answers with check marks (✓) in the blank spaces provided.

1. Are you a person who enjoys most foods?

Yes _____ No _____

2. Do you always get to eat the foods you like?

Yes _____ No _____

3. (a) Do you include fruits or fruit juices as part of your food intake?

Yes _____ No _____

(b) If yes, are citrus fruits or juices included?

Yes _____ No _____

4. Answer part (a) or part (b) not both.

(a) If fruits or juices are included in your regular meals or snacks, about how much do you have for a week?

_____ 1 - 6 servings for the week

_____ 7 - 13 servings for the week

_____ 14 servings for the week

_____ more than 14 servings for the week

(b) If fruits or juices are not included in your meals or snacks, what are your reasons?

5. (a) Do you include vegetables other than potatoes in your meals?
Yes _____ No _____
If yes to (a) do (b and c), if no, do (d).
- (b) If yes, about how much do you have for a week?
_____ 1 - 6 servings for a week
_____ about 7 servings for a week
_____ 8-13 servings for a week
_____ about 14 servings for a week
_____ more than 14 servings for a week
- (c) If yes, does your intake of vegetables include green leafy and yellow vegetables such as cabbage, spinach, carrots, squash, etc?
Yes _____ No _____
- (d) If vegetables are not included in your meals, what are the reasons?

- (e) How many servings of potatoes do you have for a week?
_____ none
_____ 1 - 6 servings a week
_____ about 7 servings a week
_____ more than 7 servings a week
6. (a) From the frequency list below, select the one which best describes How often you include in your meals, foods from the following list:
Food List: Cookies and sweet rolls, cakes, pies, waffles, pancakes, baking powder biscuits.
_____ never
_____ 1 - 6 servings a week
_____ 7 servings a week
_____ more than 7 servings a week
- (b) How often do you include cooked cereal (porridge) or dry cereal eg. cornflakes?
_____ never
_____ 1 - 6 servings a week
_____ 7 servings a week
_____ more than 7 servings a week

7. (a) Do you drink milk as part of your regular meals or as a snack?

Yes ____ No ____

- (b) If yes, about how much do you usually drink for a week?

____ less than 7 cups a week

____ about 7 cups a week

____ 8 - 20 cups a week

____ 21 - 28 cups a week

____ more than 28 cups a week

- (c) If you do not drink milk, what are your reasons?

8. From the frequency list below, select the one which best describes how often you include in your meals, foods from the following list:

Food list: milk puddings (cooked or instant)
ice cream, cereal with milk
other dishes using milk (specify) _____

Frequency list:

____ never

____ 1 - 6 times a week

____ about 7 times a week

____ more than 7 times a week

9. From the frequency list below, select the one which best describes how often you include in your meals, foods from the following list:

Food list: meat (fresh, canned, smoked, etc.) and including fish and poultry, eggs, cheese or cheese dishes.
dried peas and beans (eg. split peas, kidney beans, baked beans)

Frequency list:

____ never

____ 1 - 6 servings a week

____ about 7 servings a week

____ more than 7 servings a week

10. (a) Do you ever skip meals?

Yes ____ No ____

- (b) If yes, about how many would you skip for a week?
Use a number to indicate your answer.

____ morning meals

____ noon meals

____ evening meals

11. Answer either part (a) or part (b). Do not do both parts.
Listed below are some reasons that people give for skipping meals.

- (a) If you are a person who skips meals, put the number 1 in front of your most usual reason, and the number 2 in front of the next usual reason.

I skip meals because:

____ the meal is not prepared for me when I am ready to eat

____ I am always in too much of a hurry to stop and eat

____ I just do not feel like eating the meal

____ I never eat breakfast

____ I am served foods that I do not care to eat

____ meal times clash with other activities

____ I have to prepare the meal for myself

____ there are no set meal times and family members eat at different times

____ I get too much criticism about my eating habits.

- (b) Even though you do not skip meals, which of the reasons below would be the most likely to make you miss meals?

Indicate your first and second choices with the numbers 1 and 2.

I would probably miss meals because:

____ the meal is not prepared for me when I am ready to eat

____ I am always in too much of a hurry to stop and eat

____ I just do not feel like eating the meal

____ I never eat breakfast

____ I am served foods that I do not care to eat

____ meal times clash with other activities

____ I have to prepare the meal for myself

____ there are no set meal times and family members eat at different times

____ I get too much criticism about my eating habits

12. (a) Do you ever eat meals or snacks away from home?
Do not include meals made at home and eaten elsewhere
Yes ____ No ____

- (b) If yes, how many would you estimate for a week?
Use a number to indicate your answer.

____ morning meals
____ noon meals
____ evening meals
____ snacks

13. (a) It is assumed that some people eat snacks in between meals.
Do you eat snacks between meals?
Yes ____ No ____

- (b) From the following list of snack items, indicate in the blanks to the left, the ones you usually have when you snack.

____ milk	____ apple
____ soft drinks	____ ice cream
____ cookies or cake	____ milk shake
____ pie	____ ice cream soda
____ popcorn	____ hot dog
____ candies	____ hamburger
____ coffee or tea	____ chips, eg. potato, corn, etc
____ cheesies	____ raisins
____ sandwich	____ pizza
____ sunflower seeds	____ celery
____ carrot	____ orange
____ peanut butter	____ bread
____ doughnuts	____ nuts

- (c) Use the numbers 1 - 6 to indicate the period in which you usually eat most of your snacks. The number 1 would mean the time period in which you usually snack most, and the number 6 the time period in which you snack the least.

____ early in the morning
____ about mid-morning, or in-between morning classes
____ about noon hour'
____ about mid-afternoon, or in-between afternoon classes
____ before the evening meal
____ after the evening meal (Including before bedtime)

14. Using the code below, indicate who prepares meals on school or working days, and on non-school or non-working days.

CODE:

- a = mother
 b = self, ie. you
 c = mother and self
 d = father
 e = each prepares own meal
 f = other (specify) _____

- (a) On school or working days:

Morning meals are usually prepared by _____

Noon meals are usually prepared by _____

Evening meals are usually prepared by _____

- (b) On non-school or non-working days:

Morning meals are usually prepared by _____

Noon meals are usually prepared by _____

Evening meals are usually prepared by _____

15. (a) If someone else is responsible for preparing meals in your home,
 Do you help with preparations?

Yes _____ No _____

- (b) How often would you say that you help to plan meals?

_____ 3 times a day

_____ once or twice a day each week

_____ a few times a week

_____ once or twice a month

_____ never

- (c) How often would you say that you help to prepare meals ie. help
 with the cooking, etc.

_____ 3 times a day each week

_____ once or twice a day each week

_____ once or twice a month

_____ never

- (d) How often would you say that you are fully responsible for preparing
 meals in your home?

_____ 3 times a day each week

_____ once or twice a day each week

_____ a few times a week

_____ once or twice a month

_____ never

15. continued

(e) How often would you say that you are responsible for planning and preparing meals?

- ☐ 3 times a day each week
☐ once or twice a day each week
☐ a few times a week
☐ once or twice a month
☐ never

16. If or when you are not involved in meal preparations in your home, indicate with the numbers 1 and 2 your two most usual reasons.

- ☐ I am always too busy
☐ I am not interested in preparing meals at home
☐ My help is not needed or appreciated
☐ My mother or the person in charge does not think I am capable of preparing or helping to prepare meals
☐ I like to try new things and I always get into trouble for doing so.
☐ My mother feels that she can prepare meals faster and more economically
☐ I prefer meals that are prepared by someone else
☐ Other (specify) _____

17. In your home, when is it usually decided what the family will have for meals?

Use the following code to indicate your answers.

CODE: a = more than a week ahead of time
 b = a week ahead of time
 c = one day ahead of time
 d = at the preceding meal
 e = when the meal is due to be prepared
 f = as the meal is being prepared

The morning meal is usually decided _____

The noon meal is usually decided _____

The evening meal is usually decided _____

18. Of your selection (a,b,c,d,e or f) in question 17, why is the decision made that way for:

(a) the morning meal

(b) the noon meal

(c) the evening meal

19. (a) Who decides what foods to buy in your home?

_____ Mother

_____ Father

_____ Mother and Father

_____ Mother and self ie. you and your mother

_____ Father and self ie. you and your father

_____ Self ie. you

_____ Other (specify) _____

(b) Who shops for food in your home?

_____ Mother

_____ Father

_____ Mother and Father

_____ Mother and self ie. you and your mother

_____ Father and self ie. you and your father

_____ Self ie. you

_____ Other (specify) _____

20. Generally, which member of your family has most influence on what foods are served in your home?

_____ Mother

_____ Father

_____ Self

_____ Other (specify) _____

21. Which of the meals below would you say most closely represents a nutritionally adequate meal?

_____ banana cream pie, chocolate cake and coke
 _____ liver and bacon, chili con carne, milk shake
 _____ roast beef, bread, carrot and milk
 _____ hamburger and pizza
 _____ french fries, apple, ice cream

22. (a) From the following groups of foods, indicate your favourite group or groups.

_____ meat, fish, egg, poultry, cheese
 _____ cereal (including porridge), bread, cake, pastry
 _____ fruits (including fresh, canned, frozen and juices)
 _____ vegetables (not including potatoes) fresh, frozen and canned
 _____ milk and ice cream

- (b) From the list below, indicate the group you eat least often.

_____ meat, fish, poultry, cheese, egg
 _____ fruits (including fresh, canned, frozen and juices)
 _____ cereal (including porridge) bread, cake, pastry
 _____ vegetables (not including potatoes) fresh, frozen or canned
 _____ milk and ice cream

- (c) According to your answer to 22(b) why is this so?

23. Canada's Food Guide recommends certain amounts of different foods for different population groups such as children, adults and adolescents.

- (a) For the food items below, circle the number which represents what Canada's Food Guide recommends for you.

Milk 0 1 2 3 4 5 6 7 cups a day
 Fruits, including citrus 0 1 2 3 4 5 6 7 servings a day
 Potatoes 0 1 2 3 4 5 6 7 servings a day
 Other vegetables 0 1 2 3 4 5 6 7 servings a day
 Bread and Cereals 0 1 2 3 4 5 6 7 servings a day
 Meat, fish, poultry or eggs,
 cheese, dried peas and beans 0 1 2 3 4 5 6 7 servings a day

(b) Do you follow Canada's Food Guide?

Yes ____ No ____

(c) If no, what are your reasons?

24. (a) Use the numbers 1 and 2 to indicate the two best sources of Vitamin A in the list of foods below -

- ____ roast beef
- ____ spinach
- ____ milk
- ____ butter or margarine
- ____ citrus fruits or juices
- ____ oatmeal porridge
- ____ carrots
- ____ candies
- ____ tomatoes
- ____ don't know.

(b) Use the numbers 1 and 2 to indicate the two best sources of Vitamin C in the list of foods below -

- ____ oatmeal porridge
- ____ milk'
- ____ citrus fruits or juices
- ____ spinach
- ____ butter or margarine
- ____ carrots
- ____ tomatoes
- ____ candies
- ____ roast beef
- ____ don't know.

25. Use the numbers 1, 2, and 3 to indicate which three nutrients in the following list should definitely be included in adequate amounts in the food intake of pregnant women.

<input type="checkbox"/> phosphorous	<input type="checkbox"/> Vitamin D
<input type="checkbox"/> fat	<input type="checkbox"/> Vitamin C
<input type="checkbox"/> iron	<input type="checkbox"/> thiamine
<input type="checkbox"/> water	<input type="checkbox"/> riboflavin
<input type="checkbox"/> calcium	<input type="checkbox"/> niacin
<input type="checkbox"/> Vitamin A	<input type="checkbox"/> carbohydrate
<input type="checkbox"/> protein	<input type="checkbox"/> don't know.

26. A certain mineral is necessary in the body for the formation of hemoglobin and for the prevention of anemia especially in females.

(a) that mineral is _____ (name the mineral)

(b) From the following list of foods, indicate with the numbers 1 and 2 the two best sources of the mineral you named above in 26(a)

☐ green beans
☐ white bread
☐ spinach
☐ vitaminized apple juice
☐ raisins
☐ fortified margarine
☐ cornflakes
☐ liver
☐ tomatoes

☐ don't know

27. If you were overweight, which foods in the following list should you eat in limited amounts?

1. ☐ lean meat
2. ☐ ice cream
3. ☐ bread
4. ☐ broccoli
5. ☐ carrots'
6. ☐ potatoes
7. ☐ eggs
8. ☐ pies
9. ☐ cakes
10. ☐ spinach
11. ☐ pizza

28. From the list of food items in question 27, indicate by numbers:
- ☐ the best sources of fuel and energy
 - ☐ the best foods for growth and repair of body tissues
 - ☐ the best foods to prevent night blindness
 - ☐ don't know
29. From the following list of food items, indicate with the numbers 1,2,3 and 4 the ones you regard as the four best sources of protein.
- ☐ orange
 - ☐ baked potato
 - ☐ milk
 - ☐ broccoli
 - ☐ cheese
 - ☐ popcorn
 - ☐ apple
 - ☐ spinach
 - ☐ eggs
 - ☐ tomatoes
 - ☐ lean meat
 - ☐ vitaminized apple juice
 - ☐ fish
 - ☐ fortified margarine
 - ☐ brown bread
 - ☐ don't know
30. Some foods need special attention in preparation, cooking and serving in order to conserve certain nutrients.
- (a) From the list of food items below, indicate with the numbers 1 and 2 the two which you think need special attention in order to conserve nutrients (ie. to prevent loss of food value)
- Food list:
- ☐ milk and milk products
 - ☐ fruits
 - ☐ meat
 - ☐ vegetables
 - ☐ bread and cereals
 - ☐ don't know

30. continued

- (b) According to your answer to question 30(a), what nutrients are you trying to save in these food items.

_____ don't know

- (c) According to your answers to 30(a) and (b), when these foods are cooked in your home, is any effort made to save the nutrients you named?

Yes _____ No _____

31. From the list below, indicate which has been your most influential source of nutrition information. Put the numbers 1 and 2 beside your two most influential sources.

_____ 4H clubs
 _____ Mother
 _____ Girl Guide training
 _____ Home Economics classes
 _____ Girls clubs
 _____ Health classes
 _____ Friends Others(specify) _____

32. (a) Do you discuss Foods and Nutrition with your mother or guardian?

Yes _____ No _____ Sometimes _____

- (b) If yes, does she (he) ever use any of your ideas?

Yes _____ No _____ Sometimes _____

33. How frequently would you say that you apply your knowledge of Foods and Nutrition at home?

_____ usually
 _____ often
 _____ seldom
 _____ never

34. What word from the list below best describes how frequently the recipes you suggest are used by your mother or guardian?

_____ usually
 _____ often
 _____ seldom
 _____ never

35. In which of the following areas do you think your knowledge of Foods and Nutrition has most influence in your home?

☐ Menu planning for nutritionally adequate meals
☐ Selection and serving of food on the basis of colour, texture and flavour
☐ Preparation of food for best nutritive value

36. Answer part (a) or part (b) not both.

- (a) If you are taking Home Economics in High School, how do you think your mother or your guardian feels about the classes you are taking in Foods and Nutrition?

☐ I think that she does not care one way or the other
☐ I think that she thinks that it is a waste of time
☐ I think that she is interested in what I learn and wants to know more about it
☐ I think that she does not mind, provided I do not expect her to practise my school ideas at home
☐ I think that she thinks that she has no time to bother with Foods and Nutrition the way it is given in school
☐ I think that she thinks that she could teach me all I need to know about Foods and Nutrition
☐ I think that she thinks that the course is not practical
☐ I think that she would like to see me practise more of what I learn

- (b) If you took Home Economics in Junior High School only, how do you think your mother or guardian feels about the courses you took in Foods and Nutrition?

☐ I think that she does not care one way or the other
☐ I think that she thinks that it is a waste of time
☐ I think that she is interested in what I learned and wants to know more about it
☐ I think that she does not mind, provided I do not expect her to practise my school ideas at home
☐ I think that she thinks that she has no time to bother with Foods and Nutrition the way it is given in school
☐ I think that she thinks that she could teach me all I need to know about Foods and Nutrition
☐ I think that she thinks that the course is not practical
☐ I think that she would like to see me practise more of what I learn

37. In what grades have you taken Foods and Nutrition?

Grade VII ☐ VIII ☐ IX ☐ X ☐ XI ☐ XII ☐

APPENDIX 4

Mothers Interview Schedule

Code No.....

We are interested in your ideas about Foods and Nutrition education as you see it through your daughter's attendance at Home Economics classes.

We would also like to find out a little about some of your dietary practices.

1. Have you visited any of the Home Economics departments in any of the schools in the city?

Yes _____ No _____

2. (a) Would you be interested in visiting Home Economics departments in some high schools, say once a year?

Yes _____ No _____

- (b) If no, why not? _____

3. How many of your children are now attending:

High school (Gr. X-XII) - 1, 2, 3, 4 or more

Junior High school (Gr. VII - IX)- 1, 2, 3, 4 or more

Elementary school (Kindergarten - Gr.VI) - 1, 2, 3, 4 or more

4. (a) Do you find it taxing (difficult) to prepare meals to please your schoolage child (children)?

Yes _____ No _____

- (b) If yes, what are your main problems?

- 5 (a) Do you get any help from your daughter _____ in meal preparation?

Yes _____ No _____ Sometimes _____

- (b) If yes, what kind of help does she give?

Probe for help in menu planning _____

help in cooking food _____

help in serving food _____

- (c) If no, why is it that your daughter does not help? _____

- (d) Would you say that you get more help in meal planning, preparation or serving from daughter in:

High school _____ Junior High school _____

Probe for reasons:

6. In your home when is it usually decided what the family will have for meals?

(each meal will be taken separately, and a code card containing different times will be given to respondent for her to select the one which best describes when meals are decided upon in her home).

CODE: a = more than a week ahead of time
 b = a week ahead of time
 c = one day ahead of time
 d = at the preceding meal (ie. the meal before)
 e = when the meal is due to be prepared
 f = as the meal is being prepared.

(a) The morning meal is usually decided _____ because _____

(b) The noon meal is usually decided _____ because _____

(c) The evening meal is usually decided _____ because _____

7. (a) When you select foods and plan meals for your family, do you follow any kind of guide as to what foods to select?

Yes _____ No _____

(b) If yes, what do you follow?

(c) If no, would you say that you select foods and prepare meals on a whatever is available basis?

Yes _____ No _____

Probe: If yes, why? _____

Probe: If no, on what basis then do you select foods and plan your meals?

8. (a) Would you please tell me what you had to eat in the last 24 hours.

Morning meal: _____

Snack: _____

Noon Meal: _____

Snack: _____

Evening Meal; _____

Snack: _____

Probe for forgotten items, eg. candies, nuts, etc.

- (b) Is this a typical days menu? Yes _____ No _____

Comments, if no.

9. (a) Do you usually include fruits or fruit juices in your meals or snacks?

Yes _____ No _____

- (b) If yes, are citrus fruits or juices included?

Yes _____ No _____

10. (a) If fruits or juices are included in your meals or snacks, about how much do you have for a week?

_____ 1 - 6 servings

_____ 7 - 13 servings

_____ 14 servings

_____ more than 14 servings

- (b) If fruits or juices are not included in your meals or snacks, what are your reasons?

11. (a) Do you include vegetables other than potatoes in your meals?

Yes _____ No _____

- (b) If yes, about how much do you have for a week?

_____ 1 - 6 servings

_____ about 7 servings

_____ 8 - 13 servings

_____ about 14 servings

_____ more than 14 servings

- (c) If yes, does your intake of vegetables include green leafy and yellow vegetables such as cabbage, spinach, carrots, squash, etc?

Yes _____ No _____

- (d) If vegetables are not included in your meals, what are the reasons?

- (e) How many servings of potatoes do you have for a week?

_____ none
 _____ 1 - 6 servings
 _____ about 7 servings
 _____ more than 7 servings

12. (a) From the frequency list below (respondent will have the list on card) select the one which best describes how often you include in your meals, foods from the following list -

FOOD LIST: Cookies, and sweet rolls, cakes, pies, waffles, pancakes, baking powder biscuits.

FREQUENCY LIST:

_____ never
 _____ 1 - 6 servings a week
 _____ about 7 servings a week
 _____ more than 7 servings a week

- (b) How often do you include cooked cereal (porridge) or dry cereal, e.g. cornflakes in your meals?

FREQUENCY LIST:

_____ never
 _____ 1 - 6 servings a week
 _____ 7 servings a week
 _____ more than 7 servings a week

13. (a) Do you drink milk as part of your regular meals or as a snack?

Yes _____ No _____

- (b) If yes, about how much do you usually drink for a week?

_____ less than 7 cups for the week
 _____ about 7 cups for the week
 _____ 7½ - 10 cups for the week
 _____ 10½ cups or more for the week

- (c) Do you include milk in other things such as coffee, tea, cereal, puddings, etc.

Yes _____ No _____

- (d) If you do not take milk in any form, what are your reasons?

14. From the frequency list below, (card for respondent) select the one which best describes how often you include in your meals, foods from the following list:

FOOD LIST: meat (fresh, canned, smoked, etc.) and including fish and poultry, eggs, cheese or cheese dishes.
dried peas and beans (eg. split peas, kidney beans, baked beans).

FREQUENCY LIST:

- _____ never
_____ 1 - 6 servings a week
_____ 7 servings a week
_____ more than 7 servings a week

15. We have just checked your weekly intake of several foods. Would you say that your family follows the same pattern of food intake as you do for:

(a) fruits and juices (including citrus)

Yes _____ No _____ Sometimes _____

Probe for differences:

(b) Vegetables (not including potatoes)

Yes _____ No _____ Sometimes _____

Probe for differences:

(c) Potatoes

Yes _____ No _____ Sometimes _____

Probe for differences:

(d) Cookies, sweet rolls, etc.

Yes _____ No _____ Sometimes _____

Probe for differences:

(e) Cereal

Yes _____ No _____ Sometimes _____

Probe for differences:

(f) Milk and milk products:

Yes _____ No _____ Sometimes _____

Probe for differences:

(g) Meat and meat substitutes

Yes _____ No _____ Sometimes _____

Probe for differences:

16. If you were overweight, which of the following foods would you eat in limited quantities (ie. cut down on)

_____ lean meat
 _____ ice cream
 _____ bread
 _____ broccoli
 _____ carrots
 _____ potatoes
 _____ eggs
 _____ pies
 _____ cakes
 _____ spinach
 _____ pizza

17. In your opinion, which of the following meals most closely represents a nutritionally balanced meal?

_____ banana cream pie, chocolate cake, coke
 _____ liver, bacon, chili con carne, milk shake
 _____ roast beef, bread, carrots, milk
 _____ french fries, apple, ice cream
 _____ hamburger, pizza

18. During pregnancy, certain nutrients are most important to the health of the pregnant woman.
 From the list of nutrients below (card for respondent) which 3 do you think the pregnant woman should definitely not neglect?

_____ protein	_____ water
_____ fat	_____ iron
_____ calcium	_____ carbohydrate
_____ vitamins	

19. (a) Which mineral is very important for building blood? _____
- (b) Do you know which of the foods below are important for building blood?
- _____ green beans
- _____ liver
- _____ margarine
- _____ milk
- _____ spinach
- _____ tomatoes
- _____ don't know
20. Have you ever taken part in any of the following? (list on card)
- _____ homemaking classes
- _____ cooking classes
- _____ home economics classes
- _____ health classes
- _____ none of the above
- _____ other (specify) _____
21. (a) From which of the following sources could you have obtained knowledge of Foods and Nutrition?
- _____ (a) your mother
- _____ (b) school (H.Ec. classes which you attended)
- _____ (c) neighbours
- _____ (d) books and magazines
- _____ (e) teenage daughter attending (or who attended)
- _____ (f) women's clubs
- _____ (g) job training
- _____ (h) doctor
- _____ (i) other, (specify) _____
- (b) If (d) ie. books and magazines, do any of these belong to your teenage daughter?
- Yes _____ No _____
22. (a) Does your daughter _____ discuss Foods and Nutrition with you?
- Yes _____ No _____
- (b) If yes, how often does this happen?
- _____ Occasionally ie. now and then
- _____ seldom ie. hardly ever
- _____ usually ie. quite often

23. (a) Does your daughter _____ ever give you ideas about Foods and Nutrition.

Yes _____ No _____ Sometimes _____

- (b) If yes, do you use the ideas you get from her?

Yes _____ No _____ Sometimes _____

Probe: If ideas are not used, why?

24. Your daughter _____ could be of help to you in several ways. In which of the following would you find her most helpful? The numbers 1, 2 and 3 will indicate priority.

_____ selecting foods so that there is variety in color, texture, flavor, etc.

_____ cooking the food to prevent loss of food value

_____ planning meals to include all the foods that are necessary for good health.

Probe for reasons:

25. (a) Has your daughter _____ ever made any suggestions as to how you could prepare and serve meat in order to conserve nutrients (food value)?

Yes _____ No _____

If yes, what suggestions and what nutrients?

- (b) Vegetables:

Yes _____ No _____

If yes, what suggestions, and what nutrients?

(c) Fruits:

Yes _____ No _____

If yes, what suggestions and what nutrients?

Probe: if your daughter is not helpful in any way, why in your opinion is this so?

26. (a) Generally, which member of your family has most influence on what foods are served in your home?

_____ (a) husband
 _____ (b) you (self)
 _____ (c) daughter (_____)
 _____ (d) other(specify) _____

- (b) Any special reason why _____ is the most influential?

27. Who decides what foods to buy in your home?

_____ self
 _____ husband
 _____ teenage daughter (_____)
 _____ teenage daughter and self
 _____ teenage daughter and her father
 _____ other (specify) _____

28.

- (a) From the following groups of foods, indicate your favourite group or groups (list given on card).

_____ meat, fish, eggs, poultry, cheese
 _____ cereal (including porridge) bread
 _____ cake, pastry
 _____ fruits (including fresh, canned, frozen and juices)
 _____ vegetables (not including potatoes) fresh, canned, frozen
 _____ milk and ice cream

- (b) Which is the group you eat least often?

- (c) Why do you eat this group less often than others?

29.

It is believed that education in Foods and Nutrition improves the eating practices of students and their families.

- (a) How do you feel about this belief as far as your daughter is concerned?

_____ strongly agree
 _____ agree
 _____ disagree
 _____ strongly disagree
 _____ don't know

- (b) What are your reasons to _____ with the statement

30. (a) In what grade or grades has your daughter _____
taken Home Economics?

VII, VIII, IX, X XI, XII

- (b) How do (did) you feel about what your daughter has learnt
about Foods and Nutrition in the grade or grades of Home
Economics taken?

_____ satisfied

_____ don't know

_____ dissatisfied

Probe for reasons:

31. In your opinion, how important is nutrition as far as meal planning
is concerned?

_____ very important

_____ quite important

_____ fairly important

_____ not important

_____ no opinion

Probe for reasons:

I would like you to know that any information given me in this interview will be kept personal and confidential.

Your interview schedule has no name on it, only a code number, therefore no one could identify or associate you with this information.

To continue the interview I would like you to supply the following information in the next set of questions, to enable us to get all the necessary data for our study.

32. In your family how many children do you have in the following age groups? (card to respondent)

0 - 11 years 0 1 2 3 4 or more

11 - 17 years 0 1 2 3 4 or more

over 17 years 0 1 2 3 4 or more

33. (a) Which of the following categories of grades represents the school grade in which you last attended school.

_____ 1 = grade school 1-6

_____ 2 = junior high 7-9

_____ 3 = high school 10-12

_____ 4 = secretarial or business course

_____ 5 = attended university

_____ 6 = completed university

_____ 7 = graduate work at University

_____ 8 = technical or trade school

_____ 9 = apprentice training on the job

_____ ~~10~~ = teacher's college

- (b) Which of the categories above represents the grade in which the head of the family (other than you) last attended school?

_____.

34. From the following list of incomes, where would you say your family falls?

_____ 1 = under \$1,000. a year

_____ 2 = \$1000. - \$3000. a year

_____ 3 = \$3000. - \$5000. a year

_____ 4 = \$5000. - \$7000. a year

_____ 5 = \$7000. - \$9000. a year

_____ 6 = \$9000. - \$11000. a year

_____ 7 = \$11000. - \$13000. a year

_____ 8 = \$13000. - \$15000. a year

_____ 9 = over \$15000. a year

35. (a) Which of the following best describes your position?

- _____ 1 = you work full time and keep house
 _____ 2 = you only work full time (no housekeeping)
 _____ 3 = you work part time and keep house
 _____ 4 = you work part time (no housekeeping)
 _____ 5 = you only keep house (no outside work)

(b) If you work outside the home, what kind of work do you do?

(c) What kind of work does your husband or head of the house do?

36. Into which of the following age groups do you fall?

- _____ 1 = 34 - 39 years of age
 _____ 2 = 40 - 45 years of age
 _____ 3 = 46 - 50 years of age
 _____ 4 = over 50.

37. Which of the following statements most closely represents how you feel about your daughter taking classes in Foods and Nutrition in Junior or Senior High school?

- _____ I do not care one way or the other
 _____ I think it is a waste of time
 _____ I am interested in what she has learned and would like to know more about it.
 _____ I do not mind, provided she does not expect me to practise her school ideas at home
 _____ I do not have time to bother with Foods and Nutrition the way it is given in school
 _____ I think I could teach her all she needs to know about Foods and Nutrition
 _____ I think the Foods and Nutrition courses being given are not practical.
 _____ I would like to see her practise more of what she has learnt.

We have come to the end of this interview, and I would like to thank you for your co-operation.

INTERVIEWER'S COMMENTS:

APPENDIX 5

"Food Habits Survey" form

Nutrition Division, Government of Canada

SCORE SHEET FOR EACH DAY'S MEALS

FOOD AND CREDITS (The maximum score for each group is 20)		Your Score						Food Group Average															
MILK - fluid milk (see 1), cheese (see 2), milk dishes (see 3) <table border="0"> <tr> <td>Children up to about 11 years)</td> <td>Adolescents</td> <td>Adults</td> </tr> <tr> <td>4 cups.....20</td> <td>4 cups.....20</td> <td>1½ cups.....20</td> </tr> <tr> <td>3 cups.....15</td> <td>3 cups.....15</td> <td>1 cup.....15</td> </tr> <tr> <td>2 cups.....10</td> <td>2 cups.....10</td> <td>½ cup.....10</td> </tr> <tr> <td>1 cup.....5</td> <td>1 cup.....5</td> <td></td> </tr> </table>		Children up to about 11 years)	Adolescents	Adults	4 cups.....20	4 cups.....20	1½ cups.....20	3 cups.....15	3 cups.....15	1 cup.....15	2 cups.....10	2 cups.....10	½ cup.....10	1 cup.....5	1 cup.....5								
Children up to about 11 years)	Adolescents	Adults																					
4 cups.....20	4 cups.....20	1½ cups.....20																					
3 cups.....15	3 cups.....15	1 cup.....15																					
2 cups.....10	2 cups.....10	½ cup.....10																					
1 cup.....5	1 cup.....5																						
FRUIT (see 4) 20 1 serving of citrus fruit or tomatoes or their juices (see 5).....15..... 1 or more servings of other fruit - fresh, canned, dried or frozen.....5.....																							
VEGETABLES (see 4) 20 3 or more servings (one should be potatoes).....15..... 2 servings.....10 1 serving.....5 If one or more servings are green, leafy, yellow or raw, extra.....5..... Include fresh, canned, dried and frozen vegetables.																							
CEREALS, BREAD (see 4) 20 1 or more servings of whole grain cereal.....8..... Bread (not more than 4 slices may be scored).....8..... Enriched white, 1 point per slice.....4 Nutritionally improved (see 6), 2 points per slice.....8 Butter.....4.....																							
MEAT, FISH, POULTRY OR MEAT ALTERNATES (see 7) 20 1 or more servings of meat, fish, poultry or meat alternates such as eggs and cheese15..... Extra for liver, heart or kidney.....5..... Eggs (if not scored as meat alternate).....5..... Cheese (if not scored as meat alternate or in milk group)5.....																							
VITAMIN D PREPARATIONS - liquid, capsules, tablets or drops For Children and Adolescents.....10.....																							
TOTAL MAXIMUM SCORE - Adults.....100 Children and Adolescents.....110																							

AVERAGE SCORE FOR WEEK _____

Children and Adolescents

For Adults

A score of 95 or over is very good.

A score of 80-94 is good.

A score below 80 is only fair, try to improve.

A score of 85 or over is very good.

A score of 70-84 is good.

A score of 70 is only fair, try to improve.

* Score Modifications

Maximum Score - 100

85 or over Very Good

70-84 Good

55-69 Fair

Less than 55 Poor

NOTES

1. A cup is an 8 fluid ounce measuring cup. A pint is 20 fluid ounces or 2½ cups.
2. Cheese, two one-inch cubes can be scored as ½ cup milk.
3. Milk dishes (cream soup, milk puddings) can be scored as ½ cup milk.
4. An average serving of vegetable, fruit or cereal is ½ cup. Servings will be smaller for children.
5. VITAMINIZED apple juice can be used in place of citrus fruit or tomatoes or their juices.
6. A nutritionally improved bread contains such foods as whole wheat, wheat germ, rye, dried milk, oatmeal, raisins.
7. Meat alternates - 2 eggs, 1 cup baked beans, three one-inch cubes of cheese.

APPENDIX 6

Canada's Food Guide

CANADA'S FOOD GUIDE

THESE FOODS ARE GOOD TO EAT.

EAT THEM EVERY DAY FOR HEALTH.

HAVE THREE MEALS EACH DAY.

MILK

Children (up to about 11 years) 2½ cups (20 fl. oz.)

Adolescents 4 cups (32 fl. oz.)

Adults 1½ cups (12 fl. oz.)

Expectant and nursing mothers 4 cups (32 fl. oz.)

FRUIT

Two servings of fruit or juice

including a satisfactory source of vitamin C
(ascorbic acid) such as oranges, tomatoes,
vitaminized apple juice.

VEGETABLES

One serving of potatoes.

Two servings of other vegetables,
preferably yellow or green and
often raw.

BREAD AND CEREALS

Bread (with butter or fortified margarine).

One serving of whole grain cereal.

MEAT AND FISH

One serving of meat, fish or poultry.

Eat liver occasionally.

Eggs, cheese, dried beans or peas, may be used
in place of meat.

In addition, eggs and cheese each at least three times a week.

VITAMIN D

400 International Units, for all growing persons and expectant
and nursing mothers.

APPROVED BY THE CANADIAN COUNCIL ON NUTRITION, 1961.

NUTRITION DIVISION, DEPARTMENT OF NATIONAL HEALTH & WELFARE, CANADA

MILK

Children (up to about 11 years)	2½ cups (20 fl. oz.)
Adolescents	4 cups (32 fl. oz.)
Adults	1½ cups (12 fl. oz.)
Expectant and nursing mothers	4 cups (32 fl. oz.)

FRUIT

Two servings of fruit or juice including a satisfactory source of vitamin C (ascorbic acid) such as oranges, tomatoes, vitaminized apple juice.

VEGETABLES

One serving of potatoes.
Two servings of other vegetables, preferably yellow or green and often raw.

BREAD AND CEREALS

Bread (with butter or fortified margarine).
One serving of whole grain cereal.

MEAT AND FISH

One serving of meat, fish or poultry.
Eat liver occasionally.
Eggs, cheese, dried beans or peas, may be used in place of meat.
In addition, eggs and cheese each at least three times a week.

APPENDIX 7

Terms Used in the Study

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- Dietary intake - is used interchangeably with food intake, and refers to one's total intake of food, that is the amount and kinds of food eaten.
- 24-hour recall - Thus a 24-hour recall of dietary intake refers to the recall and recording of the estimated quantity of all foods eaten in the 24-hours prior to time of recall.
- Meal practices - may be used interchangeably with food habits, and refers to the habitual intake of food, for instance specific time or manner of eating food.
- Dietary practices - refers to the combination of dietary intake and dietary practices. In other words, how and when, and what foods are eaten in what amounts.
- Estimated weekly food intake - refers to the current usual weekly intake of foods as estimated by the subjects. Assessment is based on Canada's Food Guide's recommended intake of food.

- Nutrition concept - refers to a thought, idea, or general notion concerning some aspect of nutrition.
- Nutrition principles - fundamental ideas or laws about nutrition upon which other ideas or laws are built.
- Intervening variables - or factors, refer to any variables that interfere favourably or otherwise. In this case, anything that relates to the practice, or lack of practice of nutrition knowledge.
- Dependent variable - customarily called the criterion, refers to certain subject characteristics of interest (Blalock, 1968). For the present study the dietary intake of the girls is the dependent variable used to observe possible relationships with several independent variables.
- Independent variables - causal stimuli, factors, or treatments which affect the dependent variable (Blalock, 1968). Examples in this study are, Family income, and mothers occupation.

Mothers occupation - refers not to individual job situation of the mothers, but to whether or not they are full or part-time housewives, or full-time employees.