

An Assessment of the Eating Behaviour Concerns, Dietary Practices and
Nutrition Information Sources of
Mothers Of Preschool Children

by

Lynn Marie Gates

A thesis
presented to the University of Manitoba
in partial fulfillment of the
requirements for the degree of
Master of Science
in
Foods and Nutrition

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ABSTRACT

There is a need for further information on the dietary practices of preschool children as recent guidelines have focused on health promotion starting early in life. Therefore, a telephone survey was undertaken to assess the eating behaviour concerns, dietary practices, and sources of nutrition information of a random sample of 247 mothers of preschool children in Manitoba. Maternal awareness of the relation of diet to health was also determined. A significant proportion of the mothers (38.1%) were not concerned about any aspect of their children's eating habits. Of the mothers who did express concerns, the most frequently mentioned were: fussy eating habits (23.5%); limited vegetable intake (19.4%); dawdling (14.2%); and the consumption of too many sweets (12.6%). Many of the eating behaviour concerns were interrelated. While few mothers mentioned nutrition-related diseases as dietary concerns, 83.4% of the respondents were aware of the relation of diet to health, 85.4% of which attempted to change the eating habits of their preschoolers for health reasons. Mothers were more likely to attempt dietary changes with younger preschool children. The most frequently reported dietary changes included decreasing intake of sugar, decreasing intake of salt, and serving a balanced diet. Maternal awareness of the relation of diet to health was reflected in the high frequency of reported use of wholegrain breads (68.0%), low sugar cereals (90.0%), low-fat milk (55.5%), margarine (75.2%), and restricted use of salt

(70.0%). Seventy-five percent of mothers used food treats for non-nutritive purposes such as rewards and pacifiers, particularly urban and rural women. Of the food treats most frequently offered to children, 68% were classified as nutritionally and dentally unacceptable. The majority (85.9%) of the foods offered most frequently as between-meal snacks however, were snacks recommended by nutritionists and dentists. There was an overuse of vitamin-mineral supplements as 64.4% of the preschoolers received supplements, 18.2% of which were with the physician's approval. Younger mothers were more likely to supplement their child's diet than older women. The mothers' primary sources of nutrition information were pamphlets, magazines, and the education system. Professional sources were considered most helpful by 15% of the respondents, particularly mothers with a lower socioeconomic status. The results have implications for nutrition education as they suggest that mothers would benefit from information on supplements, non-nutritive uses of food, and how to judge whether a child's intake of food is adequate.

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Chapter I

INTRODUCTION

A review of the literature identified a paucity of research on the dietary practices of preschool children in North America. Limited data are available for Canada, particularly for Manitoba. The only national survey conducted in Canada, between 1970 and 1972 (the Nutrition Canada Survey), sampled only 72 young children from birth to four years of age in Manitoba (Health Protection Branch, 1977b). Information presently available on the dietary practices of preschool children does not answer the question of whether current practices are in accord with recent recommendations for feeding preschool children. Data available on the dietary practices of preschool children is inadequate as information is not available on current parental eating behaviour concerns, maternal awareness of the relation of diet to health, implementation of preventive dietary practices or nutrition information sources used by mothers.

Past preschool nutrition surveys have enabled health educators to plan and develop programs and resources to aid in the education of parents of preschool children. With each development in the literature, new guidelines are established for feeding the young child. Recent guidelines have focused on health promotion and disease prevention starting early in life. As food habits formed during the preschool years are thought to form the base of lifetime eating habits (Jones, 1981; Lowenburg, 1981), the preventive dietary practices specified in

the "Nutrition Recommendations For Canadians" (Health Protection Branch, 1977b) have been promoted to parents of preschool children. It is important at this time to closely examine the dietary practices of parents of preschool children to determine if the newer preventive dietary guidelines are reaching this population group.

In addition, it is important to determine whether nutritionists have been successful in alleviating age-old parental concerns about their children's eating behaviours. Traditionally, parents have been concerned about the adequacy of their child's diet (Beal, 1957; Eppright et al., 1969; Metheny et al., 1962a; Metheny et al., 1962b; Crawford et al., 1974). This concern arises as physical growth slows during the preschool years and thus, appetite may be decreased (Jones, 1981; Wurtam, 1981; Dierks and Morse, 1965). Parental misunderstanding of this change in physiological requirements may result in an overestimation of the amount of food needed by preschool children. Bribery and threats are often used to encourage eating (Metheny et al., 1962a; Eppright et al., 1969), which may result in poor eating habits and lay the base for later nutritional problems (Hammar et al., 1972; Birch, 1981; Birch et al., 1981).

In recognition of the significance of early childhood food habits, the primary objective of the present survey was to assess the eating behaviour concerns and dietary practices of parents of preschool children. Also, parents sources of nutrition information, awareness of the relation of diet to health, and implementation of the "Nutrition Recommendations For Canadians" was determined. Demographic data were collected in order to identify characteristics of the population and their relationship to the other variables studied.

The results of this study will provide background information and direction to health professionals involved in planning nutrition programs directed towards the preschool child, and will identify the means through which sound nutrition information may be communicated to parents of young children.

Chapter II

REVIEW OF LITERATURE

Information related to recommended feeding practices for preschool children is rapidly increasing and changing. However, there is an unfortunate but inevitable time lapse before advances in the understanding of child nutrition are ultimately integrated into the actual feeding practices and attitudes of parents.

The recent "Nutrition Recommendations For Canadians", published by Health and Welfare Canada (Health Protection Branch, 1977b), have been promoted to all age groups except infants. Preschool children have been included in the guidelines in the hopes that appropriate food habits established during the early years will last a lifetime. An important issue to be addressed at this time is whether parents of young children are implementing the recommendations or if, instead, they consider other dietary concerns more important in feeding their children. While some of the concerns of parents of preschoolers have been well documented - such as food jags and poor appetite - it is not known if parents are also concerned about the role of diet in the prevention of lifestyle diseases, and are subsequently modifying the diet patterns of their children. It is possible that the issues that concern parents today in feeding preschool children are not the same issues that were shown to concern parents in past research.

2.1 DOCUMENTED PARENTAL CONCERNS

Few children pass through the preschool years without creating some parental concern about their dietary habits. An emerging pattern of strong food preferences and aversions typically begins at one year. The preschool child often becomes finicky and capricious in his food choices, and may settle on a steady diet of three or four items for several weeks (Wurtam, 1981; Beal, 1957). Although this response is predictable, parents are often unprepared for this alteration in their child's food consumption patterns, and their concern over this issue has been frequently reported.

In 1965, an extensive survey of preschool eating habits was conducted in twelve North Central States by Eppright et al. (1969). Two thousand mothers of young children were asked to check from a submitted list the maternal concerns they had about the eating behaviour of their preschool child. The data indicated that many of the homemakers were worried about the amount of food their child was consuming, as they felt that their preschooler was eating too little. The peak incidence of concern occurred when the child was three to four years of age, at which time 28.3% of the mothers were worried about their child's level of food intake.

Similar results were reported by Crawford et al. (1978) who asked mothers of 226 male and 222 female preschoolers in Berkeley, California, whether they were satisfied with the amount of food their children were consuming. When the children were four years of age, 75% of the mothers were satisfied with their preschooler's food intake, while 23% wanted their children to eat more, and 2% wanted their children to eat less.

This period of parental concern about the amount of food their preschool child is eating, coincides with the peak incidence of poor appetite among preschoolers reported by Beal (1957), who in 1946 began a ten year longitudinal growth study of sixty-five children. Over the course of the study, the mothers were asked to rate their child's appetite as "Excellent", "Very Good", "Good", "Fair", "Poor", and "Very Poor", and to record any fluctuations in appetite over the preschool period. Thus, although the data are based on fourteen hundred nutrition histories collected over the ten year period, caution must be used when interpreting the results because of the limited number of children studied, who were not randomly selected.

At six months, approximately 85% of the children were reported to have a "Good" or "Excellent" appetite. A significant decrease in appetite became apparent when the children were three years of age, at which point only 20% of the preschoolers were considered by their mothers to have a "Good" or "Excellent" appetite. Sixty percent of the children were rated "Fair" by their mothers, and twenty percent were considered to have a "Poor" appetite. Only five of the children studied by Beal (1957) had not received an appetite rating lower than "Fair" during the preschool period. A reversal began to occur after the age of four, so that by seven years of age, the majority of children had appetites that were once again considered "Good" or "Excellent".

During this period of decreased appetite, many of the mothers described their children as erratic in their approach to food. The preschoolers were easily distracted from eating, and fussiness at mealtime increased, especially during the evening meal. In spite of this per-

ceived decrease in appetite, the children's mean intake of calories and nutrients did not decrease (Beal, 1957; Beal, 1974). However, the change in the food consumption pattern of their child was a preoccupation with many of the parents and a cause for concern.

The decrease in appetite that often occurs during the preschool period has been explained by a slowdown in the rate of growth that occurs at this time. This results in an actual decrease in nutritional needs in relation to body size (Wurtam, 1981; Dierks and Morse, 1965; Jones, 1981). The rate of growth falls after four months and by two years of age only about 1% of ingested calories is required for growth. Although physical activity has markedly increased, proportionally fewer calories per unit of body weight are needed at the preschool age than in the young infant (Jones, 1981). Due to a misunderstanding of this alteration in physiological growth patterns, variations in the child's food intake may result in an excessive concern about the nutritional adequacy of the preschooler's diet.

In contrast to the significant number of parents who were concerned that their preschoolers were eating too little, only a small percentage of the parents surveyed by Eppright and co-workers were worried that their children were overeating. The peak incidence of concern occurred when the child was four to five years of age, at which time 5.4% of the mothers listed the overconsumption of food as a problem (Eppright et al., 1969). However, it is evident that over the preschool period, this was not a major source of concern for most parents. In the preschool years, the frequency of parental concern about a child eating too little far exceeded that of eating too much. Information was not given on how

parents dealt with their concern, but it is hoped that parents who consider their preschooler to be overeating are not severely restricting their child's food intake, since an energy intake sufficient to sustain normal growth must be maintained.

While few of the mothers surveyed by Eppright et al. (1969) were concerned that their child's total caloric intake was excessive, a significant percentage of the mothers were worried that their preschooler was consuming too many high-sugar foods. This concern came sharply into focus in the two to three year old age group (26.3% of mothers), with a peak incidence of concern occurring when the child was three to four years of age (28.9%). Sweet foods, such as candy and desserts, were the foods that the mothers most frequently tried to limit in their child's diet, as they felt such foods were non-nutritious and associated with weight problems. Crawford and associates, who surveyed mothers of preschool children when their children were two, three, four and six years of age, found that 15% of the mothers also wished that their children would eat fewer sweets, at each age group (Crawford et al., 1978).

Another aspect of preschool feeding habits that has been well documented as a cause of concern to many parents is the problem of dawdling at mealtime. When a child is tired, and motivation is low, dawdling is often the consequence. One-third of the mothers surveyed by Eppright et al. (1969) stated that their preschoolers played with their food and had to be encouraged to eat. The evening meal was generally the least well received and created the greatest amount of parental concern. The peak incidence of concern about dawdling occurred when the preschoolers were three to four years of age, at which point 43.8% of the children were

considered dawdlers by their mothers. This coincided with the highest frequency of concern about limited food consumption. No difference in the incidence of dawdling was found between the male and female children. However, children who played with their food were more likely to come from well-educated and high income families. First-born children were also more likely to be considered dawdlers by their parents, than later-born children. Dawdling was also less likely to occur in a large family than in a small family.

Many of the two thousand mothers questioned by Eppright and co-workers also reported a general reluctance on the part of the preschooler to eat at mealtimes. The incidence of this problem increased from eighteen months to three to four years of age, at which point 75% of the children were considered to be disinterested in food (Eppright et al., 1969).

A reluctance to eat during the preschool period is further supported by data obtained in a study conducted by Metheny et al. (1962a). Ninety-six mothers of 104 children who ranged in age from 2 1/2 to 5 1/2 years, were asked whether they needed to encourage their preschooler to eat, and the method of encouragement used. Fifty percent of the mothers stated that their child needed to be prompted to eat.

Inquiries were also made about the children's general attitude toward food or mealtime. The mothers were asked to categorize their children as generally "enjoys eating", "attitude varies", "indifferent", "finicky eater", or as being generally "resistant to food". Fifty-five percent of the children were classified as enjoying their meals and generally having a positive attitude toward food. Twenty-four percent of

the children were considered by their mother's to have a varying attitude - sometimes willing to eat and sometimes not. Twelve percent were considered to be indifferent to food, and 6% of the children were classified as being generally finicky about most foods. Three percent of the children were reported as being especially resistant to eating (Metheny et al., 1962a).

Several other dietary concerns were mentioned by the two thousand mothers surveyed by Eppright and co-workers. First, forty percent of the mothers of two to three year old children were concerned that their child was consuming only a limited variety of foods. This concern was prevalent throughout the preschool period, climbing to a peak of 44.8% of the parents of the four to five year olds and then declining thereafter (Eppright et al., 1969).

Particular concern was expressed regarding the limited consumption of vegetables. Eighteen percent of the children from birth to three years of age were reported by their mother's to refuse all vegetables. This increased to a peak incidence among the 4 1/2 year olds, at which point 24% of the preschoolers were considered by their mothers to generally dislike vegetables. The vegetables most frequently mentioned as being disliked were those described as strong flavoured by the authors, such as spinach, carrots, green beans, and peas (Eppright et al., 1969). Another longitudinal study that followed 448 preschool children from two to six years of age also found that at each age more than 50% of the mothers wanted their children to eat more vegetables (Crawford et al., 1978).

The reluctance of preschool children to consume vegetables has been well documented in the literature. Studies on the food consumption patterns of young children have shown that vegetables are often poorly accepted by this age group (Close and Sabry, 1978; Ireton and Guthrie, 1972; Beyer and Morris, 1974; Crawford et al., 1978).

A significant number of mothers surveyed by Eppright et al. (1969) were concerned about the meat and milk intake of their preschool children. Twenty-two percent of the mothers of two to three year olds were concerned that their preschoolers' meat consumption was not sufficient, and 20% of the mothers did not think their child drank enough milk. In contrast, 3.5% of the mothers surveyed were concerned that their preschool child was eating too much meat, and 10% felt their child was drinking too much milk (Eppright et al., 1969).

Taken together, these studies suggest that parents need guidance on the typical amount of food and the average serving sizes required by young children. Mothers appear to have difficulty judging whether their child's diet is nutritionally adequate.

2.2 PRACTICES EMPLOYED BY PARENTS TO INFLUENCE EATING HABITS

A general disinterest in food is typical of the preschool period and may be the consequence of a decreased appetite, increasing social mobility, and an increasing need to exert independence (Wurtam, 1981). Unfortunately, many parents resort to such negative approaches as punishment, threats, and force as a means of encouraging their child to eat. Although 46% of the two thousand mothers surveyed by Eppright et al. (1969) reported that they generally ignored the situation, 18% of

the women indicated that they punished their child, or denied them pleasurable items. Sixteen percent of the mothers also reported forcing or demanding that their preschooler eat, 14% reasoned or coaxed the child, 4% substituted a liked food, and 1% of the mothers threatened or bribed their children (Eppright et al., 1969).

Forty-eight percent of the mothers surveyed by Metheny et al. (1962a) also reported that they needed to encourage their child to eat, and a variety of methods were employed. Seventeen percent of the mothers restricted or withheld certain pleasures until the child finished eating, 12% gently encouraged or coaxed their child, 5% referred to a remote attractive goal as a means of encouraging their child to eat, 4% granted the child an immediate reward if he/she ate the meal, and 3% of the mothers surveyed verbally reminded the child to eat.

This "clean the plate" attitude may lead to the preschool child developing food habits which could lead to future weight problems. Pipes and Rees (1981) recommend that food should be presented to children without comment and the child permitted to consume amounts that he or she desires. Portions served should be scaled to the child's appetite, when the meal is over, food should be removed and the child permitted to leave the table.

2.3 USE OF FOOD FOR NON-NUTRITIVE PURPOSES

Many of the mothers questioned by Eppright and associates were also found to frequently use food for non-nutritious purposes. Twenty-three percent of the mothers surveyed mentioned that they often used foods as a reward for good behaviour, and 29% stated that they used food as a

pacifier. The reward foods most frequently offered, in descending order of use, were baked goods and desserts (75%), sweets and candies (39%), and fruits (32%). The use of high sugar snack foods for such purposes is ironic as the overconsumption of sweets was a concern to many of the mothers surveyed by Eppright et al. (1969).

Ten percent of the mothers questioned by Eppright also stated that they used the deprivation of favourite foods as a form of punishment. The same foods used as a reward - baked goods and desserts, sweets and candies, and fruits - were withheld as a means of promoting appropriate behaviour (Eppright et al., 1969).

The researchers who conducted the Preschool Nutrition Survey also noted a high incidence of food given for reward or withheld as a form of punishment. The use of food in this manner varied with age, as older children (4 - 6 years) were more likely to be treated in this manner than younger children (1 - 2 years) (Owen et al., 1974).

A study of preschool children in England, reviewed by Baric et al. (1974), also found that sweets and other "junk" foods were the type of food used predominantly as gifts, rewards, treats and tokens of affection. The researchers found that 98% of the children received sweets from their mothers for these reasons. In addition, 91% of the children received rewards and gifts in the form of sweet foods from their grandparents, 82% received sweets from their fathers, and 87% received such foods from other relatives, friends and neighbours. A high proportion of the older preschool children also received presents of sweet foods on special occasions such as birthdays, Easter, and Christmas.

Baric and associates also found that sweet foods were used as a means of reinforcing desired behaviour. Of the children studied, 58% received sweet foods as rewards, 38% as bribes, 38% as incentives to learn, and 38% of the children received sweets as pacifiers (Baric et al., 1974).

Birch et al. (1981) in an investigation of the effects of different social-affective contexts on 64 preschool children's food preferences found that presenting a food as a reward enhanced preference for that food. The effects on preference were not transitory but were still evident six weeks after the conclusion of the study. The results suggest that the extent to which sweet foods are presented as rewards at home or school could enhance preschool children's preferences for such foods.

In another recent study Birch (1980) also demonstrated that the effects of such procedures are not limited to food presented in a positive manner, but are generalized to other foods perceived by the child to be similar to the presented food. In general, the results of this research indicate that presentation of a food in a positive context enhances a preschool child's preference for that food and increases consumption of that food.

A reward system used with preschool children may carry a subtle and unintended message of its own. A research study designed to influence the consumption of five unpopular or unfamiliar vegetables by preschool children used "tokens" as rewards for eating the disliked vegetables. All children were offered fruit for dessert, but those with tokens could exchange them for more "desirable" desserts such as ice cream. The findings indicated that reinforcement was an effective method of shaping

desired eating behaviour as the preschoolers increased their consumption of the vegetables (Ireton and Guthrie, 1972).

The use of food in this manner implies first, that vegetables were not good to eat (otherwise, why would rewards be given for eating them), and second, that ice cream and other sweets were more desirable than fruit (Birch, 1981). Margaret Mead (1943) suggests that the same process may occur in the home.

In the average home, the right food and the wrong food are both placed on the table; the child is rewarded for eating the "right" food and so taught that the right food is undesirable - for parents do not reward children for doing pleasant things. At the same time children are punished by having the "wrong" food taken away from them; here again, the lesson is taught to the child that that which is delicious is an indulgence - for which one is punished or with which one can be rewarded.

Therefore, the use of favourite foods as positive and negative reinforcers may develop an early emotional association with sweet foods in the preschool child. This may result in poor food habits, since the consumption of high sugar foods may be made more desirable.

Hammar et al. (1972) collected data on twenty children regarding infant and childhood feeding practices and their relation to later adolescent obesity and found that the use of sweet foods as positive reinforcers during early childhood may be related to later weight problems. The researchers found that eight of the mothers of ten obese adolescents had used food (candy and desserts) as a reward for good behaviour, or to get the child to eat a disliked food. In contrast, only three of the mothers of non-obese children admitted to using food as a positive reinforcer. While the results of this pilot study must be viewed very cautiously due to the small sample size ($n=20$), the implications of this

research support the general recommendation frequently stressed by nutritionists that such negative practices should not be employed with young children (Manitoba Department of Health and Community Services, 1980; B.C. Ministry of Health, 1981).

The socioeconomic status of the family appears to have some influence on parents' permissiveness in regard to preschool eating habits. Owen et al. (1974), who investigated the nutritional habits of 5,300 preschool children in the United States, found that mothers from a lower socioeconomic level more frequently catered to their children's food preferences and more often used food as a reward or withheld food when the child misbehaved. Parents, irrespective of socioeconomic status, were more likely to use food to reward or punish older children, four to six years of age, than young children, one to two years of age.

The results of the studies conducted by Eppright et al. (1969), Owen et al. (1974) and Baric et al. (1974) indicate that the use of sweet foods as rewards or pacifiers is a pervasive practice in the North American and British culture. Parents and others who interact with young children need to be made aware of the effects of such practices as Birch et al. (1981) and Hammar et al. (1972) have shown that they may be associated with an increased preference for foods used in this manner, and later weight problems.

2.4 VITAMIN/MINERAL SUPPLEMENTATION

An examination of the literature available on the nutritional status of preschool children in North America reveals that few nutritional deficiencies, as assessed by biochemical and dietary parameters, are prevalent among this age group (Health Protection Branch, 1975a; Brown et al., 1970; Fox et al., 1970; Dierks and Morse, 1965; Owen et al., 1969; Owen et al., 1974; Sims and Morris, 1974; Futrell et al., 1971; Driskell and Price, 1974; Eppright et al., 1972; Myres and Kroetsch, 1978; Sabry et al., 1974; Hueneman, 1974). Nevertheless, the prevalence of vitamin and mineral supplementation is high during the preschool period. This may be due to the high incidence of concern expressed by parents of preschool children regarding the amount of food their children consumed.

The studies conducted by Beal(1957) indicated that 60% of the 65 children surveyed received vitamin/mineral supplements regularly. The use of supplements was positively related to the mothers' level of education, but was not found to be associated with the income of the family.

In contrast to Beal's work, data collected by Owen et al. (1974), who examined the use of vitamin supplements by 5300 preschool children surveyed in the Preschool Nutrition Survey, indicated that the use of vitamin/mineral supplements increased with increasing socioeconomic status, as defined by occupation, income, and dwelling area. The use of supplements was also found to be negatively associated with the increasing age of the preschool child. A total of 3,444 (64%) children were found to be receiving some type of vitamin/mineral supplement. The ma-

majority, 1731 (32%), were taking a multivitamin preparation, while 486 (9%) were receiving an iron supplement, and 15 (0.3%) were taking a calcium supplement.

Kerrey et al. (1968) also found an association between the use of vitamin/mineral supplements and the socioeconomic status of the family. The researchers obtained three day food records on forty children, age 3 1/2 to 5 1/2 years, in Lincoln, Nebraska. The children were divided into two equal groups, with children from middle and upper class families being placed in the "High Income" group, and children from lower income families forming the "Low Income" group. The data indicated that 65% of the children from the "High Income" group were receiving a supplement, compared to 25% of the children from the "Low Income" group.

A further study conducted at the University of Minnesota examined the supplementation patterns of 115 preschool children, whose parents were students at the university. The results revealed that 70% of the mothers gave their child a vitamin/mineral supplement all of the time, while 10% used a supplement sometimes, or only during the winter. The type of supplement used supplied at least 100% of the Recommended Daily Allowance for preschool children (Dierks and Morse, 1965).

While it is evident that many preschool children are receiving a vitamin/mineral supplement, little care seems to be given to the selection of a supplement that will complement the child's diet. The researchers conducting the Preschool Nutrition Survey in the United States were impressed by the finding that so many children whose diet seemed to be adequate with regard to vitamins were regularly receiving vitamin supplements (Owen et al., 1974).

The type of supplement given to children has often been found to have little relationship to the type of nutrient most needed by the child. Data collected in the Nutrition Canada survey on the nutritional status of 535 preschool children, indicated that the nutrients least likely to be consumed in the recommended amounts were iron, ascorbic acid and vitamin A (Health Protection Branch, 1975b). Several surveys examining the nutritional status of preschool children in the United States have also revealed that iron and calcium were the least well-supplied nutrients. Other nutrients found to be supplied in less than the recommended amounts - especially among children from low-income families - include ascorbic acid, vitamin D and vitamin A (Owen et al., 1974; Futrell et al., 1971; Driskell and Price, 1974; Eppright et al., 1972; Brown et al., 1970; Fox et al., 1970; Dierks and Morse, 1965; Owen et al., 1969; Owen et al., 1971a; Owen et al., 1971b; Haddy et al., 1974; Abraham et al., 1974; Ten State Nutrition Survey, 1973).

While it seems evident that a less than adequate iron intake is prevalent among preschool children, only 4% of the children surveyed by Beal (1957) received some type of iron supplementation. Less than 1% of the children received Vitamin A, D or C supplements. Only 7% of the preschoolers received supplementation consisting of a combination of Vitamins A, D, or C. A multi-vitamin pill was given most frequently, with 33% of the children receiving this type of supplementation.

Supplements appear to be given for general reasons. Forty-five percent of the mothers surveyed by Eppright et al. (1972) stated that they gave their preschooler a vitamin/mineral supplement because their physician recommended it. This was especially true for mothers with a

high level of family income and an extensive educational background. Lower-income mothers were more likely to use supplements because of a decision based on their own judgements.

2.5 CURRENT DIETARY CONCERNS AND PRACTICES

The studies discussed in section 2.4 to illustrate parental concerns and dietary practices, were conducted primarily in the 1960's. The question is, are these the concerns of today's parents or are there other eating behaviour problems that are sources of concern to parents of young children.

The 1970's witnessed a resurgence of interest in the relationship between nutrition and health (White and Selvey, 1979). In December, 1976, the Committee on Diet and Cardiovascular Disease reviewed the literature and subsequently made recommendations that were adopted by Health and Welfare Canada (Health Protection Branch, 1977b). These recommendations included:

1. The consumption of a nutritionally adequate diet, as outlined in Canada's Food Guide.
2. A reduction in calories from fat to 35% of total calories. Include a source of polyunsaturated fatty acid (linoleic acid) in the diet.
3. The consumption of a diet which emphasizes whole grain products and fruits and vegetables and minimizes alcohol, salt and refined sugars.
4. The prevention and control of obesity through reducing excess consumption of calories and increasing physical activity. Pre-

cautions should be taken that no deficiency of vitamins and minerals occurs when total calories are reduced.

These recommendations for Canadians were designed to be general nutrition guidelines, and as such are moderate and non-quantitative in nature. These guidelines were developed to improve the health of Canadians by reducing dietary risks associated with cardiovascular disease, hypertension, obesity, and dental caries. The guidelines were also designed to help in educating the public to take some responsibility for promoting personal health by selecting an appropriate diet (Health Protection Branch, 1977b).

The "Nutrition Recommendations For Canadians" apply to all healthy Canadians two years of age and older. Normal infants younger than two years of age were excluded from the recommendations due to a lack of knowledge concerning the essentiality of dietary cholesterol and the effects of a high polyunsaturated fat intake on normal infant growth (Health and Welfare Canada, 1977).

While the recommendations are hardly news to most nutritionists, it is not known whether parents of preschool children are aware of the recommendations and are subsequently making modifications in their dietary practices, or whether they are ignoring - or are ignorant of - the guidelines altogether.

Current evidence suggests that the general public is indeed aware of a diet-to-health connection. Opinion surveys conducted in both Canada and the United States have shown that the public's interest in nutrition and health is growing, and that the attitudes of the public toward nutrition are positive (Yankelovich et al., 1978; Rae and Neilsen, 1980).

Results from the evaluation of a campaign conducted by provincial health units in 1978 to increase public awareness of the "Nutrition Recommendations For Canadians" indicated that the public was aware of a relationship between diet, exercise, weight control and heart attacks, and overall health. However, there was some confusion among the public about preventative actions which could be taken (Health Promotion Directorate, 1978).

More recently, a questionnaire was administered by personal interview to four hundred respondents in the Prairies region, eighteen years of age and older, to assess the public's concept of nutrition and health. Respondents appeared to have a high personal regard for nutrition since 80% believed that a sensible diet was important to them personally. Over 80% of the respondents mentioned that better health was the benefit of sensible eating habits. The next most frequently mentioned advantages were general well-being and fewer weight problems (Rae and Neilsen, 1980).

Respondents were asked whether or not they had made any major changes in their eating habits in the past year, and if so, why these changes were made. The study found that 40% of all respondents reported that they had made changes; with women more likely than men to have done so. The proportion of respondents reporting changes was age-related, with more dietary modifications being reported among the 18 to 24 year olds, and the least changes being reported by people 50 years of age and older (Rae and Neilsen, 1980).

Most of the reported changes were made in the types of food eaten such as less sweets, candies, and junk food, more fresh fruits and vege-

tables, fewer fats and fatty foods, and less salt and salty foods - all changes in agreement with the "Nutrition Recommendations For Canadians". A small proportion of the respondents also mentioned fewer preservatives and additives and more natural foods and more protein, minerals, and vitamins. Younger respondents, 18 to 24 years of age, reported eating less junk food more frequently than older respondents. Respondents 50 years of age and older more frequently mentioned changes regarding the consumption of less fat, less salt, and the consumption of fewer calories (Rae and Neilsen, 1980).

The most frequently mentioned reasons for making changes in eating habits were to reduce weight (39%) and to feel better (26%). Less frequently mentioned reasons, in decreasing order, included doctor's advice, for better health, economic reasons, for improved appearance, more knowledge about nutrition, and for dental reasons (Rae and Neilsen, 1980).

Similar findings were reported by Charron (1981) who surveyed the eating habits of 1,795 Quebecers, eighteen years of age and older. Almost one-third of the respondents reported that they had attempted to make changes to their eating habits during the preceding year. More women reported making dietary changes (38.8%) than men (25.3%).

The most frequently mentioned changes agree with the objectives of the "Nutrition Recommendations For Canadians". The respondents were conscious of having eaten more vegetables (50.5%), consumed less fat (48.9%), eaten more fruit (45.0%), consumed fewer pastries and candies (44.7%) and less total sugar (40.8%), used less salt (30.0%) and eaten less meat (27.4%).

Similar results have been reported in American health opinion surveys. A survey conducted by the United States Department of Agriculture indicated that 40% of the households interviewed stated that they had changed their diets on the basis of concerns about their health. Respondents who reported making dietary modifications were more likely to be from higher income households where the homemaker had more years of education (Jones, 1977).

Another more recent American study also documented the public's increased awareness of and concern about preventive health measures such as dietary modifications and exercise. They reported similar results to those found in the Nutrition Concepts Study (Jones and Abrams, 1979).

While information is not available on whether parents of preschool children are concerned about preventive health issues, we do know that other segments of the Canadian population are. Nutrition educators would benefit by knowing if the newer concepts are reaching the population, and the channels through which nutrition information reaches parents of preschool children.

2.6 SOURCES OF NUTRITION INFORMATION UTILIZED BY MOTHERS

Few recent studies have examined the nutrition information sources utilized by mothers of preschool children. However, several surveys conducted in the 1960's provide some insight into what nutrition information sources were utilized in the past. In 1962, Metheny et al (1962b) asked 93 urban mothers of preschool children to check from a submitted list of seven possible sources of information, the three sources they considered to have had the greatest effect on their dietary

practices. The respondents then ranked the sources according to their degree of influence. The results indicated that the women felt that their past education and homemaking experiences had been the most influential factors affecting how they fed their families. The second most important source of nutrition information listed were printed materials. However, this category included the use of cookbooks, which were used for new recipe ideas, rather than for nutrition information per se. Of the twenty women (21%) who listed professionals as one of their major sources of information, the paediatrician was the person most frequently consulted. Nutritionists and home economists were generally not considered a major direct influence on their family feeding practices. However, it is questionable whether such services were readily available at that time. Relatives, friends, and neighbours were considered more influential sources of nutrition information than the health professionals.

Another study conducted in the 1960's by Eppright et al. (1969) examined the sources of nutrition information used by mothers of preschool children. Two thousand women were asked to list all of the sources of nutrition information that they had used. The data collected revealed that the mothers relied heavily on printed materials. Sixty-three percent of the mothers of preschool children reported getting nutrition information from magazines, 48% from newspapers, 47% from books, 34% from television, 21% from radio, and 17% received nutrition information from government bulletins. Seventy percent of the mothers reported receiving advice from their physician concerning how to feed their child during the first year after birth. Fifty-five percent of the mothers were

still obtaining nutrition information from their doctor when their child was five years of age, indicating that the physician remained an important resource person for the parents throughout the preschool years. Nineteen percent of the women also reported receiving nutrition information from their dentist. In contrast, only 22% of the respondents listed a nutritionist as an important information source. Rather, the women relied on personal acquaintances such as their mother and other relatives (64%) and other friends and neighbours (29%) to obtain nutrition information.

A more recent study of 163 mothers of preschool children was conducted by Sims et al. (1976). When the mothers were asked what had been their main source of nutrition information, 75% of the women mentioned their high school home economics courses. The mothers were also questioned on which person had been most influential in helping them plan meals to meet the nutritional needs of their family. Fifty percent of the mothers surveyed cited their own mother as being the most influential person, while 14% of the women stated that they had not been influenced by anyone. The mothers of the preschool children were also asked where they would go if they had a question about the nutrient content of certain fruits and vegetables. Thirty-seven percent of the mothers cited books, 29% cookbooks, 11% the home economist, 10% magazine and newspaper articles, 5% their mother or other relative, and 3% food advertisements.

To date, only one Canadian study has examined the sources of nutrition information used by mothers of preschool children. A recent survey was conducted in New Brunswick of 225 parents of young children, five to

six years of age, who were attending preschool clinics (New Brunswick Ministry of Health, 1981). The parents were asked to check from a written list the nutrition information sources they had used. The most frequently cited nutrition information source was magazines, followed by newspapers, friends or relatives, television, and schools. The researchers found that 22% of the parents reported receiving information from the school system indicating that the education system was an important source of nutrition information when older children were present in the family. Therefore, the education system appears to be an important means of teaching this information to children and for reaching their families.

While few Canadian researchers have examined the sources of information used by mothers of preschool children, several researchers have investigated the nutrition information sources used by mothers of infants. In 1977, Schwartz and Barr questioned 150 Vancouver mothers of young children on where they had obtained information on how to feed their infants. Printed sources again played a significant role in supplying nutrition information to the public - pocketbooks (28.0%), literature in physicians' office (16.2%), library books (12.8%), Adelle Davis' books (7.4%), lectures, television and radio (5.8%). The validity of some of these sources is questionable, as evidenced by the popularity of Adelle Davis' books (Schwartz and Barr, 1977).

Once again the physician was a major human source of nutrition information for the mothers, as 62.2% of the women stated that their doctor had supplied them with information concerning how to feed their infant. Sixty percent of the mothers also indicated that their physician

would be the primary source consulted if they had any further questions concerning the diet of their child. A nutritionist/dietitian was listed by only 16.8% of the respondents as a major source of nutrition information. Husbands (37.4%), mothers (17.6%), friends, neighbours, and other relatives (20.0%) were all considered more important sources (Schwartz and Barr, 1977).

The importance of the physician as a resource person for nutrition information, especially for mothers of young children, was further confirmed in a study conducted by Clark (1979). Four hundred and fifty-six Winnipeg and rural Manitoba mothers of infants were asked who had supplied them with the most useful information concerning feeding their child. Forty-six percent of the respondents reported that their doctor was their primary source of information and indicated that their physician would be the first person they would contact if they needed further advice on how to feed their family. Twenty-two percent of the mothers stated that they would call the nurse, 13% said they would refer to books, and 10% stated that they would contact relatives if they had a question about feeding their child.

A recent Canadian survey on adult Canadians suggests that the trend to rely on the physician to obtain information on nutrition may be changing. Data obtained in the 1979 "Nutrition Concepts Study", which examined Canadian consumers' sources of nutrition information in each of four geographic regions, suggests that while older women are still relying on the physician for information on how to feed their family, women younger than twenty-five years of age are frequently utilizing the school system to obtain nutrition information. In all regions, the

most frequently mentioned sources of nutrition information were family, school, magazine articles and editorials, and the physician. Common sense or general knowledge of nutrition was cited more frequently by older respondents than younger ones (Rae and Neilsen, 1980).

Another Canadian survey on the nutrition information sources utilized by adult women was conducted by Rahn (1980). The researcher asked 210 urban women, residing in a university community, where they would go for the answer if they had a question about nutrition. Health professionals were cited most frequently - including doctors, nurses, nutritionists, and the schools and university. Mass media were also mentioned by more than one-third of the respondents. Women who mentioned the doctor as a potential source of nutrition information tended to be young, with some high school education, and from a low socioeconomic status. The characteristics of the respondents who mentioned books as their preferred source of nutrition information included being well-educated, young, and of moderate socioeconomic status.

A further non-random survey was conducted by Sullivan and Schwartz (1981) on the nutrition information sources utilized by Canadian adults. Two hundred and eighty-one British Columbia adults - of which 79% were young women - revealed that the most frequently mentioned sources of information about nutrition and cardiovascular disease were magazines, books, newspapers, television, friends, physician, and the family. Fifty-nine percent of the respondents reported using professional sources to obtain nutrition information, while 77.9% used non-professional sources, and 88.3% utilized printed sources of information. The three major channels for dissemination of nutrition information suggested by

this study were the mass media, doctors, and family and friends. Mass media was cited as the principal source of information, supporting the findings of the Nutrition Concepts Report of Health and Welfare Canada.

In all of the reports mentioned, fewer than one quarter of the respondents used the most reliable source of nutrition information - the nutrition experts. Hopefully, with increasing availability and publicity of nutritionists and home economists, mothers of young children will begin to utilize the nutrition experts more frequently when faced with eating behaviour problems concerning their preschool children.

2.7 FACTORS RELATING TO THE USE OF NUTRITION INFORMATION SOURCES

2.7.1 Socioeconomic Variables

The availability and use of nutrition information sources is affected by a variety of factors. Many variables appear to be involved in the flow of nutrition information. Larsen and Hill (1954) showed that news diffuses at different rates, depending on the socio-economic status of the population. Therefore, different segments of the population pick up news from different sources. Interpersonal communications with both health professionals and personal friends was found to be a more important source of information in women of higher socio-economic status, while mass media such as radio and television, were more frequently relied upon by women of lower economic classes. Physical barriers such as lack of transportation, large family size, and lack of time may be present to prevent communication. While certain information sources may be physically available to all of the population, they are not necessarily "socially" available to all mothers of young children. Some low income wo-

men may not feel confident making contact with health professionals such as nutritionists and home economists to obtain information on nutrition.

Research conducted in the 1950's and 1960's support the hypothesis that homemakers from high income families more frequently use personal sources of information and participate more often in extension education courses and women's groups than low-income women. The majority of low-income homemakers did not generally have any direct personal contact with other sources of information and preferred to contact relatives or friends rather than professional sources (Wage, 1967; Lyle, 1959; Lionberger, 1949).

2.7.2 Maternal Education

The educational background of women also appears to influence the type of source used to obtain nutrition information. Young et al. (1956) questioned 645 homemakers in upstate New York on where they received information on how to feed their families. Women with a higher educational background more frequently utilized group meetings, magazines, and newspapers to obtain nutrition information, and were more likely to mention formal education sources. Homemakers with a lower education relied more heavily on common sense and personal sources such as their mother and other relatives.

2.7.3 Maternal Age

Shipman and McCannon (1964) surveyed urban homemakers in Wisconsin and found that maternal age was also related to the use of nutrition information sources. The researchers found that women less than thirty-

five years of age tended to use a greater number of information sources than women older than thirty-five years. There was a great range in the number of information sources used by the women surveyed, as the number of sources mentioned by the homemakers ranged from zero to nine.

The studies discussed indicate that factors such as SES, place of residence, educational attainment, and maternal age influence which information channels are utilized by women. By determining the preferred information sources of mothers of preschool children, nutrition educators can more effectively reach this target group.

Chapter III

OBJECTIVES AND HYPOTHESES OF RESEARCH

3.1 SCOPE OF RESEARCH

The study focuses on the parents of preschool children in Manitoba. The population is restricted to parents residing in the province of Manitoba. The population excludes illegitimate births due to government regulations and Indian parents living on reserves for methodological reasons. All inferences from the sample regarding the objectives and hypotheses refer to the defined population only.

3.2 OBJECTIVES

The objectives of the study were:

1. To describe the eating behaviour concerns and dietary practices of parents of preschool children, and the sources of nutrition information used by parents.
2. To determine the relationship between sources of nutrition information, dietary practices, eating behaviour concerns, and selected demographic variables.
3. To determine the awareness of the relation of diet to health and implementation of the "Nutrition Recommendations For Canadians" by parents of preschool children.
4. To make recommendations for improved approaches to nutrition education directed to the preschool child.

3.3 HYPOTHESES

The following hypotheses, stated in their null form, were formulated for the study after reviewing the literature:

1. The eating behaviour concerns (defined in 3.4.1) expressed by parents of preschool children will:
 - a) not be related to place of residence, socioeconomic status (SES), occupational status, maternal education, family size, maternal age, maternal employment, and age, birthrank and gender of the child.
2. Maternal ratings of appetite and willingness to eat (defined in 3.4.3) will:
 - a) not be related to SES, occupational status, maternal education, family size, place of residence, maternal age, employment status, or the gender, birthrank, and age of the child or maternal eating behaviour concerns.
3. Appropriate dietary practices implemented by parents of preschool children (defined in 3.4.2) will:
 - a) not be related to SES, occupational status, maternal education, place of residence, family size, maternal age, employment status, or the age, gender, and birthrank of the child.
4. Maternal eating behaviour concerns and maternal ratings of appetite and willingness to eat will:
 - a) not be related to appropriate dietary practices implemented by parents of preschool children.
5. The number of nutrition information sources used by parents of preschool children will:

- a) not be related to SES, occupational status, maternal education, place of residence, maternal age, employment status, family size, or the age, gender and birthrank of the child.
6. The use of professional sources of nutrition information (defined in 3.4.4) will:
 - a) not be related to SES, occupational status, place of residence, maternal education, maternal age, maternal employment, family size, birthrank, age and gender of the child.
 7. Awareness of the relation of diet to health (defined in 3.4.6) will:
 - a) not be related to SES, occupational status, place of residence, maternal education, family size, maternal age, employment status, or the age, gender and birthrank of the child.
 8. The implementation of the preventive dietary practices stated in the "Nutrition Recommendations For Canadians" by parents of preschool children (defined in 3.4.5) will:
 - a) not be related to SES, occupational status, place of residence, maternal education, family size, maternal age, employment status, birthrank and gender of the child.

3.4 OPERATIONAL DEFINITION OF CONCEPTS

1. Eating behaviour concerns were defined as the mothers response to the open-ended question "Is there anything about your child's food or eating habits that concerns you".
2. Dietary practices were defined as the mothers responses to open-ended questions concerning practices implemented when children

- were unwilling to eat, non-nutritive uses of food, between-meal eating habits, and supplementation patterns.
3. Mothers' perception of their children's appetite was defined as the mothers' responses to the question "Would you say that your child's appetite is (very good), (good), (fair) or (poor)?"
 4. Maternal perception of willingness to eat was defined as the mothers' responses to the question "How would you rate your child's willingness to eat?" with responses coded on a four-point scale from "always willing" to "rarely willing".
 5. Nutrition information sources were defined as the mothers responses to the open-ended question "Where have you received information on nutrition and how to feed your child"? Sources of nutrition information were coded as being obtained from professional sources if the respondent had discussed nutritional problems and questions with the health professional. If the respondent obtained literature from the health professional, without personal discussion, the information source was coded as being obtained from a media source. Media sources of information also included television, radio, and newspapers. If the respondent both obtained literature and discussed problems with the health professional, information was coded as being obtained from both a professional and media source. Personal sources of information were defined as non-professional sources from which the respondents personally and directly obtained information, including use of friends and relatives and their own common sense and past experience.

6. Implementation of the "Nutrition Recommendations For Canadians" was defined as the mothers' responses to questions concerning the consumption of wholegrain breads and cereals, low fat milk, polyunsaturated table spreads, salt use, egg use, and weight control, and mothers responses to the open-ended question "Have you made any changes in your child's food habits to decrease his/her risk for adult health problems?"
7. Awareness of the relation of diet to health was defined as the mothers' responses to the open-ended questions "Do you think that the food a preschool child eats affects his/her health later on as an adult?", and "How do you think a preschooler's food habits affect his/her health as an adult?"
8. The place of residence of each respondent was defined as metropolitan, urban and rural using the criteria of Nutrition Canada (Health Protection Branch, 1975b) which was based on 1976 Statistics Canada population figures:
 - a) Metropolitan: greater than 100,000 residents
 - b) Urban : 5,000 to 100,000 residents
 - c) Rural : less than 5,000 residents
9. Maternal employment status was defined as the mothers' responses to the question "Do you work outside the home?" Responses were classified into fulltime, parttime, or not employed.
10. Food reported to be consumed most frequently as "treats" and between-meal snacks were classified into four groups according to the recommendations of the Ontario Society of Public Health Dentists in conjunction with the Ontario Dental Association and On-

tario Public Health Nutritionists (Ontario Ministry of Health, 1975). The four groups included:

- a) Nutritionally and Dentally Poor
- b) Nutritionally Acceptable But Dentally Poor
- c) Nutritionally Poor But Dentally Acceptable
- d) Nutritionally and Dentally Acceptable

Examples of food classified within each category are listed in Appendix A.

Chapter IV

METHODS

4.1 SAMPLE

A telephone survey of parents of preschool children, two to four years of age, was conducted in Manitoba in January and February of 1982. Children of this age were chosen for the survey due to the high incidence of parental concern reported among mothers with children of this age group (Beal, 1957; Eppright et al., 1969).

The subjects were chosen as a simple random sample from a list of all children born in the province of Manitoba in 1978 and 1979. The list was obtained from the records of Vital Statistics, for which special permission was obtained. From a total of approximately 17,770 births in each year, children were randomly selected in both 1978 and 1979. Due to government regulations, illegitimate births were excluded from the randomly selected sample. Children born to parents residing outside the province of Manitoba were also excluded from the sample. In addition, children born to Indians living on reserves were excluded from the random sample due to the difficulty in obtaining reliable data from this segment of the population (Manitoba Paediatric Society Committee on Breastfeeding, 1980).

The final sample comprised 252 children randomly selected in both 1978 and 1979 for a total of 504 preschool children. Government records provided information on the age of the mother, place of residence, and age and gender of the child.

4.2 TELEPHONE SURVEYS

The goal of the research was to study a random sample of the Manitoba population of mothers of preschool children. To reach this widely distributed group at a reasonable cost in time and money, a telephone survey was chosen as the method of data collection. Telephone surveys have been shown to provide the researcher with easily accessible data, rapidly, and at low cost (Adler, 1972; Siemiatycki, 1979; Sudiman, 1966; Tyebjee, 1979; Wolfe, 1979; Woodward and Chambers, 1980; Schucker, 1982).

There are several other advantages associated with the telephone survey strategy, in addition to cost. The response rate of telephone survey strategies has been demonstrated to be higher than that of a mailed questionnaire (Levine and Gordon, 1972; Kanuk and Berenson, 1975; Berdic and Anderson, 1976). Therefore, there is an increased likelihood that unknown bias from refusals will be avoided due to the high response rate (Woodward and Chambers, 1980). In addition, the respondents may feel freer to answer questions honestly and completely when they cannot see the interviewer. Also, the respondent hears only one question at a time and is therefore not biased by subsequent questions. Therefore the quality of the data collected is improved (Adler, 1972; Sudiman, 1966). In addition, current research indicates that mothers with young children are the group most frequently contacted by telephone (Wiseman and McDonald, 1979).

Limitations associated with the telephone survey strategy include a difficulty in obtaining reliable financial data via the telephone (Loscander and Burton, 1976). In addition, questions asked via telephone

interviews must be short, easy to understand, and conversational in tone (Tyebjee, 1979).

A review of the literature leads to the conclusion that the data obtained by means of a telephone interview are equivalent to a mail questionnaire or a personal interview (Siemiatycki, 1979; Tyebjee, 1979). Siemiatycki (1979) conducted a health survey among 1559 people in Montreal to compare the results of telephone, mail and home interview strategies. The results indicated that the telephone strategies with follow-up achieved an 87-90% response rate, compared to a 76-83% response rate with the mail strategy, and at less expense. There was little variation of response rate by social class for the mail and telephone strategies, and there was no difference in the percent of questions unanswered. Validity comparisons suggested that the responses obtained by the telephone were just as valid as those responses obtained by mail questionnaires or home interviews.

4.3 QUESTIONNAIRE

The development of questions in this research was guided by the work of other authors (Metheny et al., 1962a; Metheny et al., 1962b; Eppright et al., 1969). The questionnaire was developed to assess the eating behaviour concerns, dietary practices, and nutrition information sources of parents of preschool children. Maternal awareness of the relation of diet to health and implementation of the current "Nutrition Recommendations For Canadians" was also investigated. Demographic data on the families were also collected. Table 1 summarizes the questions developed for each of the variables in the study.

TABLE 1

Listing Of Variables Examined In The Study

Variable	Question Number In Questionnaire
Eating Behaviour Concerns	6
Appetite Rating	1
Willingness To Eat Rating	7
Dietary Practices	
Non-Nutritive Uses Of Food	10 - 14
Practices To Encourage Eating	8 - 9
Between-Meal Eating	17 - 18
Supplementation	31 - 34
Awareness Of Diet-Health Link	45 - 46
Dietary Changes Due To Health Concerns	47 - 48
Implementation Of "Nutrition Recommendations For Canadians"	15 - 16 19 - 30
Sources Of Nutrition Information	35 - 44 49 - 51
Diet Restrictions	2 - 5
Demographic Data	52 - 56

The questionnaire was composed primarily of open-ended questions with possible responses pre-coded to aid interviewer efficiency and speed. Open-ended questions were selected over closed-ended questions due to the exploratory nature of the research, and to obtain the most valid and unbiased results (Payne, 1951; Woodward and Chambers, 1980). Open-ended questions have also been shown to be successful in obtaining reliable data via a telephone interview strategy (Woodward and Chambers, 1980). Closed-ended questions with ordered choices were used to rate the single dimension of perceived appetite and children's willingness to eat.

The questions were designed to embrace all levels of understanding so that the questions would have the same meaning for everyone. The questions were kept as short as possible and conversational in tone to maximize complete responses via a telephone interview (Tyebjee, 1979). Pre-planned probing was extensively incorporated into the questionnaire.

The opening questions of the interview were purposely simple and straight forward to establish rapport with the respondents prior to asking more difficult questions. Demographic questions were asked at the end of the interview to reduce respondent intimidation (Payne, 1951). Questions concerning income were not included due to the difficulty in obtaining reliable financial information via telephone interviews (Loscander and Burton, 1976).

The length of the questionnaire was kept to a minimum as the limited research available concerning the most appropriate length for telephone interviews suggests that fifteen minutes is a comfortable time for most subjects (Adler, 1972).

The questionnaire was submitted to an independent panel of 19 nutritionists for content validation (Neale and Liebert, 1980). The validators evaluated the relevancy of each item and the overall comprehensiveness of the questionnaire. Following revisions, a pretest was conducted with fifteen parents of preschool children attending nursery schools in Winnipeg, to ensure that the questions were interpreted similarly by all respondents. Based on the pretest, minor wording changes were made in certain questions. The questionnaire appears in Appendix B.

4.4 IMPLEMENTATION

The telephone numbers and addresses of the subjects were obtained via the Winnipeg and rural Manitoba telephone directories and, when telephone numbers could not be located, through forwarding addresses left with public health nurses. An introductory letter was sent to all parents in the sample to introduce the study to potential respondents and solicit their support (Appendix C). A letter prior to contact by telephone has been demonstrated to decrease the refusal rate (Tyebjee, 1979; Reingen and Kernan, 1977; Kanuk and Berenson, 1975).

The telephone interviews were conducted by the author and a trained interviewer who had previous experience with telephone surveys. The author interviewed the majority of the respondents residing in urban and rural areas. Each interview took approximately twelve minutes to complete. A successful contact was classified as a completed interview, an incomplete interview due to language difficulties, or a refused interview. A total of six telephone calls were made to each subject before

being termed an "unsuccessful contact". Four callbacks have been demonstrated sufficient to minimize non-response due to not-at-home (Tyebjee, 1979). The telephone calls were made at different times of the day to maximize the possibility of contacting each subject. The telephone was allowed to ring eight times, each call, before terminating the attempt. If the number was disconnected, an attempt was made to contact the telephone company to determine if a new telephone number was registered.

The interviewers asked to speak to the person primarily responsible for feeding the preschool child. Parents' responses to each question were recorded by hand on each questionnaire.

4.5 DATA CODING

The questionnaires were precoded by the author. The coded sheets were then keypunched onto computer cards.

The socioeconomic status (SES) of each respondent was determined using the two factor index of SES described by Green (1970). The mother's educational level and the occupation of the main wage earner were used to calculate a total SES score. In the index the education of the female head of household was used instead of the education of the male head of household as public health and sociological research have demonstrated that family health behaviour patterns correlate more highly with the woman's education (Green, 1970). Thus, the SES index used was intended to optimize the prediction of family health actions from socioeconomic data.

The technique developed by Green (1970) also eliminates the need to ask subjects about their income - information which is difficult to ob-

tain via a telephone interview (Locander and Burton, 1976). A further advantage associated with the two factor method of determining socioeconomic status is that a more realistic SES score is obtained for farm families, as income is not truly indicative of their socioeconomic status.

The mother's level of education was scored as follows:

<u>Level of Education Completed</u>	<u>Score</u>
elementary	28 - 41
high school	44 - 55
vocational	56
university	60 - 73

The occupation of the main wage earner was assigned a value ranging from 21 to 83 (Green, 1970). For single parent families, the occupation of the mother was used. If the mother was unemployed or a student - and not supported by the father - her occupation was coded with a score of 41.

To compute the SES score, the following calculation was used (Green, 1970):

$$\text{SES} = (\text{education} \times 0.7) + (\text{occupation} \times 0.4)$$

For purposes of the chi-square (X^2) test of independence, the SES scores were divided into three approximately equal groups to indicate "high", "intermediate" and "low" socioeconomic status.

4.6 DATA ANALYSIS

The data were analyzed by computer using the "Statistical Analysis System" (SAS) (SAS, 1979). One-way frequency distributions for the demographic variables provided general information about the sample. The SAS program FREQ was used to test for statistical independence of variables set forth in the hypotheses. The SAS program FUNCAT was also used as a method of testing independence in multinomial data tabulated in multiway tables. Using the FREQ ONEWAY option, FUNCAT counts the number of observations having each combination of values for all variables being analyzed. By taking the log of these counts, FUNCAT fits log-linear models to the multinomial data to test for statistical independence. The resulting test statistic belongs to the class of minimum modified Chi-Square analysis, having asymptotically central Chi-Square distributions when the corresponding null hypothesis is true. Therefore, when the variables are not related, the resulting chi-square statistic (χ^2) will not be significant. As this method assumes a dense sample, with all cells filled with observations, FUNCAT may produce invalid results if the cells contain few observations. Therefore, due to limitations of the sample size, bivariate analysis with only one variable controlled at a time was performed on the data using the FUNCAT method (SAS, 1979; Grizzle et al., 1969; Forthhofer, 1973; Grizzle and Williams, 1972).

Due to differences in the mathematical calculation of the test statistic, the Chi-Square value obtained via the FUNCAT program differs slightly from the chi-square values obtained via the FREQ program. However, this discrepancy is small and not likely to affect the interpretation of the results. All statistical test were examined at the 5% level of significance.

4.7 NONRESPONSE BIAS CHECK

As a check on the nonresponse bias, sixteen respondents, classified as unsuccessful contacts because they had moved in the past four years, were located via public health records and compared with the 231 contacted persons who had not moved (Appendix D). Using the SAS program TTEST, a t-test for non-paired samples was used to test for statistical differences between the two groups on the basis of maternal age, socioeconomic status, education, occupational status, family size and children's age.

Chapter V

RESULTS AND DISCUSSION

5.1 FINAL SAMPLE

Of the 504 subjects randomly selected, seven could be reached only by radio telephone - three had children born in 1978 and four in 1979 - and were subsequently eliminated from the sample population. Further, twenty-three introductory letters were returned "address unknown" and these subjects were eliminated from the sample. Of the remaining subjects, 211 could not be located via the telephone directory, directory assistance, or public health records. Therefore, a total of 234 subjects were classified as "unsuccessful contacts" as they could not be located (47.1%) (Table 2). Of the telephone calls placed, 263 successfully reached the parents of subjects selected for the study. Of the 52.9% of the subjects reached by telephone, 95.7% agreed to be interviewed. Five of the parents contacted did not speak or understand English and were subsequently eliminated from the interview sample. This led to a slight redefinition of the population defined in 3.1. Thus, the final sample of 247 completed interviews represents a completion rate of 49.7%. The final sample comprised mothers with the exception of one father.

TABLE 2

Subjects Contacted By Telephone

	Number Of Subjects ¹	Percent Of Subjects
Unsuccessful contacts	234	47.1
Successful contacts		
completed interviews	247	49.7
refused interviews	11	2.2
language difficulties	5	1.0
TOTAL	497	100.0

¹ excludes 7 subjects reachable only by radio telephone

5.2 SOURCES OF BIAS IN THE SAMPLE

Two possible bias sources existing in the survey which could influence the statistical inference to the target population in Manitoba arise from the unsuccessful contact group and the refusal group. A significant proportion (47.1%) of the initial random sample could not be contacted. It is possible that people who frequently change their place of residence, or discontinue using a telephone, have different characteristics than the contacted respondents, thus affecting the results ob-

tained in the survey. To explore whether this assumption was true, the demographic characteristics of sixteen respondents who had changed their place of residence but were traced via public health records, were compared to the values for the moved group. (Appendix D). It is not known whether the sixteen persons traced via public health records would be different from other subjects who moved but did not register their forwarding address with public health nurses. A student t-test was performed on the mean of the following variables: maternal age, age of children, maternal education scores, socioeconomic status, occupation scores, and family size. The results indicated that the differences between the two groups were not statistically significant, except for maternal age. Mothers who had moved tended to be younger (mean age=28.56) than subjects who had not moved (mean age=30.98). Therefore, when generalizing the results to a broader population of mothers, relationships involving maternal age must be viewed with caution.

A second source of bias that can influence the generalizability of the results obtained in survey research is the refusal rate. Only a very small percentage (4.4% of the 263 people) refused to participate in the survey.

In considering the two bias sources, it is realistic to assume that the results of the survey could be generalized to the population of English-speaking mothers of preschool children in the province of Manitoba. The exceptions are results affected by maternal age, as the contacted sample tended to be older than the broader population of mothers of preschool children in Manitoba.

5.3 DESCRIPTION OF SAMPLE

Each demographic variable examined in this survey was examined in relation to the other selected demographic variables to determine whether interrelationships existed. Only the significant relationships will be discussed in this section.

Occupation of the main wage earner was assigned a value as described by Green (1970). Occupation scores ranged from 26.0 to 83.0 (mean score =54.1). This represents the complete range of occupation scores possible. For the purpose of statistical analysis, all values were divided into three approximately equal groups representing "low", "intermediate" and "high" occupation scores (Table 3). Values were unavailable for one family as one respondent refused to divulge this information.

Education scores ranged from 32.0 to 73.0 (mean score=54.8). The majority of the respondents had a high school education (Table 4). However, 30.8% had attended university.

Maternal education was significantly related ($\chi^2 = 13.482; d.f. = 4; p = .009$) to the respondents' place of residence. University (63.4%) educated mothers were more likely to reside in a metropolitan centre than mothers with elementary and high school (45.4%) and college (21.0%) education.

Occupational status was also significantly related to maternal education ($\chi^2 = 17.057; d.f. = 1; p = .0001$). A higher proportion of respondents

TABLE 3

Occupation Status Of Main Wage Earner

Classification	Occupation Scores	Number Of ¹ Percent Of	
		Subjects	Subjects
Low	26.0 - 49.0	86	35.0
Intermediate	49.1 - 58.0	79	32.1
High	58.1 - 83.0	81	32.9
TOTAL		246	100.0

¹ excludes one case for which an occupation score was not available

with higher occupation scores were respondents with university or college education (84.0%) than with elementary or high school education (56.7%).

A rating of socioeconomic status (SES) was assigned to each family by the formula devised by Green (1970). SES scores ranged from 42.0 to 84.3 (mean score =59.9). This range represents a complete range of SES scores. For the purpose of statistical analysis all values were divided into three approximately equal groups, representing "low", "intermediate" and "high" socioeconomic groups (Table 5). Values were unavailable for one family.

TABLE 4

Distribution of Respondents By Education

Education	Number Of Subjects	Percent Of Subjects
elementary	11	4.5
high school	141	57.1
college	19	7.7
university	76	30.8
TOTAL	247	100.0

The age of the respondents ranged from 20 to 43 years (mean age=30.8) (Table 6). The respondents were about equally divided between two groups, under and over thirty years of age.

Maternal age was significantly related to the respondents' place of residence. The proportion of mothers younger than thirty-one years of age was higher in in urban (59.1%) and rural areas (58.5%) than metropolitan centres (39.7%) ($X^2 = 8.975; d.f. = 2; p = .01$).

Maternal age was also significantly related to the SES of the family. Respondents older than thirty years of age were more likely to be from higher SES families (58.5%) than lower SES families (41.2%) ($X^2 = 3.796; d.f. = 2; p = .05$).

TABLE 5

Socioeconomic Status Of Respondents

Classification	SES Scores	Number Of ¹	Percent Of
		Subjects	Subjects
Low	42.0 - 55.5	84	34.2
Intermediate	55.6 - 62.2	77	31.3
High	62.3 - 84.3	85	34.5
TOTAL		246	100.0

¹ excludes one case for which an SES value was not available

In addition, occupational status was significantly related to maternal age ($X^2 = 4.986; d.f. = 1, p = .02$). Respondents with higher occupation scores were more likely to be older mothers (71.8%) than women less than thirty years of age (58.2%).

The place of residence of the respondents was evenly distributed between the city of Winnipeg (49.0%) and non-metropolitan centres (51.0%) (Table 7).

The place of residence of the mothers was significantly related to the socioeconomic status of the family. Respondents residing in a met-

TABLE 6

Distribution of Respondents By Age

Years	Number Of Subjects	Percent Of Subjects
20 - 30	122	49.4
31 - 40	118	47.8
> 40	7	2.8
TOTAL	247	100.0

ropolitan centre were more likely to have a higher SES (61.2%) than mothers residing in an urban (45.6) or rural centre (41.4%) ($X^2 = 17.95; d.f. = 4; p = .001$).

Occupational status was also significantly related to the respondents' place of residence ($X^2 = 28.156; d.f. = 2; p = .001$). Main wage earners with a higher occupational status were more likely to reside in a metropolitan area (60.8%) than a rural setting (45.1%).

The majority of the mothers were not employed outside the home (58.7%) (Table 8).

Maternal employment was significantly related to the respondents' place of residence ($X^2 = 13.396; d.f. = 4; p = .009$). Mothers who resided in metropolitan (50.0%) and urban (30.6%) areas were more likely to be employed full-time than rural respondents (19.4%).

TABLE 7

Distribution of Respondents By Place of Residence

Residence	Number Of Subjects	Percent Of Subjects
metropolitan	121	49.0
urban	82	17.8
rural	44	33.2
TOTAL	247	100.0

TABLE 8

Distribution of Respondents By Employment

Employment Status	Number Of Subjects	Percent Of Subjects
full-time	36	14.6
part-time	66	26.7
non-employed	145	58.7
TOTAL	247	100.0

Maternal employment status was also significantly related ($\chi^2 = 4.259; d.f. = 1; p = .03$) to the education level of the respondents. Women with elementary and high school education were less likely to be employed outside the home (36.2%) than university and college educated mothers (49.5%).

The majority of the respondents did not have large families (three or more children) (Table 9). Family size ranged from one child to six children (mean number of children=2.4).

TABLE 9

Distribution of Respondents By Family Size

Number of Children	Number Of Subjects	Percent Of Subjects
1 - 2	147	59.5
3 - 4	93	37.7
5 - 6	7	2.8
TOTAL	247	100.0

Family size was significantly related to maternal age ($\chi^2 = 25.315; d.f. = 1; p = .001$). A higher proportion of mothers with three or more children were older than thirty years of age (96.3%) than thirty-years or younger (45.0%)

Family size was also related to the respondents' place of residence ($\chi^2=6.643$; d.f.=2; p=.03). Mothers residing in a rural community were more likely to have larger families (51.9%) than mothers living in metropolitan (44.4%) and urban (3.7%) centres.

A description of the respondents' preschool children by age, gender and birthrank are listed in Tables 10, 11, 12, respectively. The data refer only to the target preschool children randomly chosen from Vital Statistics records. The majority of the preschool children were three years of age (64.8%) at the time the parents were interviewed. The children's ages ranged from two to four years (mean age=2.8) (Table 10). The age of the preschool children was not related to any of the demographic variables examined.

TABLE 10

Distribution of Preschool Children By Age

Age of Child	Number Of Percent Of	
	Subjects	Subjects
2 years	66	26.7
3 years	160	64.8
4 years	21	8.5
TOTAL	247	100.0

There were slightly more female children (53.0%) than male children (47.0%) in the sample (Table 11). The gender of the preschool children was not related to any of the demographic variables examined.

TABLE 11

Distribution of Preschool Children By Gender

Gender	Number Of Subjects	Percent Of Subjects
male	116	47.0
female	131	53.0
TOTAL	247	100.0

The majority of the children (64.3%) had older siblings present in the family (Table 12). Birthrank was not related to any of the demographic variables examined.

It is evident that some of the demographic variables were interrelated. For example, place of residence was significantly related to family size, maternal employment status, SES, occupational status, maternal education, and maternal age. Interrelated variables were therefore controlled in bivariate analysis involving demographic variables.

TABLE 12

Distribution of Preschool Children By Birthrank

Birthrank	Number Of Subjects	Percent Of Subjects
firstborn	88	35.6
laterborn	159	64.4
TOTAL	247	100.0

5.4 DIETARY CONSIDERATIONS

Nine preschool children (3.7%) were reported by their mothers to be consuming special diets at the time of the interview. Almost all of the children on special diets had food allergies (90%) and thus their intake of specific foods was restricted. The remaining child was consuming a vegetarian diet. The majority of the special diets (77.7 %) were not prescribed by a physician but were self-prescribed.

In addition to the children with special dietary considerations, seven children (2.9%) were reported by their parents to have religious restrictions placed on their diets. Six of these seven children (85.7%) were Jewish and were restricted in their consumption of pork and the combination of meat and dairy products. The remaining child was not allowed to consume "blood meats" such as hotdogs due to the religious convictions of the Jehovah Witness faith.

As only a small percentage of the preschool children surveyed were consuming special diets due to medical or religious restrictions, their dietary restrictions were not likely to have affected the results of the survey. The sixteen subjects were retained in the sample.

5.5 EATING BEHAVIOUR OF PRESCHOOL CHILDREN - MATERNAL CONCERNS

A variety of eating behaviour concerns were mentioned by the respondents. In total, nineteen different dietary problems that warranted maternal concern were reported (Table 13).

A large proportion of the mothers surveyed (38.1%) reported not being concerned about any aspect of their children's eating behaviour. Respondents who were not concerned about their children's eating habits did not differ from mothers who did mention eating behaviour concerns in terms of age, employment, occupation, place of residence, SES, family size, education, or the age, gender, and birthrank of the target preschool children. Therefore, mothers who expressed concern about their preschooler's dietary patterns did not exhibit any specific demographic characteristics, suggesting that eating behaviour concerns are prevalent among mothers of preschool children, regardless of the demographic variables examined. Perhaps other demographic variables not investigated in this study are influencing maternal eating behaviour concerns.

Eating behaviour concerns reported by the respondents were examined in relation to the demographic variables examined in order to determine if mothers who expressed concerns could be characterized by specific demographic characteristics. In addition, the eating behaviour concerns expressed by the mothers were examined in relation to each other as it was speculated that many of the concerns would be interrelated.

TABLE 13

Eating Behaviour Of Preschool Children - Maternal Concerns, N=247

Maternal Concerns	Number Of Subjects	Percent Of ¹² Subjects
Not Concerned	94	38.1
Fussy Eating Habits	58	23.5
Limited Vegetable Consumption	48	19.4
Dawdling	35	14.2
Too Many Sweets	31	12.6
Too Little Food	28	11.5
Too Little Meat	23	9.3
Too Little Milk	17	6.9
Food Jags	6	2.4
Too Little Fruit	5	2.0
Too Much Food	4	1.6
Too Much Meat	3	1.2
Too Much Milk	2	0.8
Other	23	9.3

¹ totals to more than 100% due to multiple responses

² presented as percent of total sample

5.5.1 Fussy Eating Habits

The most frequently mentioned eating behaviour concern regarded fussy eating habits, reported by 23.5% of the mothers. The results agree with the findings of Eppright et al. (1969) who also found that at three to four years of age, fussy eating was the concern most frequently mentioned by mothers (41.2%).

Contrary to the formulated hypotheses, when rural and urban residing respondents were combined into a "non-metropolitan" group, maternal concern about fussy eating habits was significantly related to place of residence ($X^2 = 3.912$; d.f.=1; p=.04) (Table 14). Mothers residing in a metropolitan area were more likely to be concerned about their preschool child being a fussy eater (28.9%) than non-metropolitan residents (18.3%). This relationship was still significant when considered in the presence of maternal education ($X^2 = 3.82$; d.f.=1; p=.05) and family size ($X^2 = 4.24$; d.f.=1; p=.03) were controlled. However, the relationship between maternal concern about fussy eating habits and place of residence was no longer significant when SES, employment status, maternal age, and occupational status were controlled for, suggesting that place of residence was not a predictor of maternal concern about fussy eating habits, exclusive of the other variables.

Maternal concern about fussy eating habits was not related to maternal age, employment status, SES, occupational status, maternal education, family size, or the age, birthrank, and gender of the preschool child, agreeing with the null hypotheses. This suggests that the demographic variables were not strongly influencing maternal concern about fussy eating habits. Maternal concern about fussy eating habits was

significantly related to several other eating behaviour concerns, including amount of food consumed, meat and milk intake, and limited vegetable intake. The relationships will be discussed in subsequent sections examining the particular eating behaviour concern. Maternal concern about fussy eating habits was not significantly related to maternal concern about dawdling or excess sugar intake.

TABLE 14

Maternal Concern About Fussy Eating Habits In Relation To Place Of
Residence

Concern About Fussiness		Place Of Residence		
		M ¹	U + R ²	TOTAL
Yes	n	35	23	58
	%	28.9	18.3	23.5
No	n	86	103	189
	%	71.1	81.7	76.5
TOTAL	n	121	126	247
	%	100.0	100.0	
% OF TOTAL		49.0	51.0	100.0

¹ M=Metropolitan

² U + R=Non-metropolitan

$\chi^2 = 3.912; d.f. = 1; p = .04$

5.5.2 Limited Consumption Of Vegetables

A concern that their preschool children were consuming too few vegetables was expressed by 19.4% of the respondents. The results can be compared to Eppright et al. (1969) who found that 29.4% of mothers of children two to three years of age were concerned that their preschooler was consuming too few fruits and vegetables.

Maternal concern about limited vegetable consumption was significantly related to the gender of the children ($X^2 = 4.329$; d.f.=1; $p=.03$) (Table 15), not supporting the proposed hypothesis. Mothers of female preschool children were more likely to be concerned that their children were not eating enough vegetables than mothers of male children (14.5% versus 25.0%).

Further, there was a significant relationship between maternal concern about limited vegetable intake and the birthrank of the child ($X^2 = 7.035$; d.f.=1; $p=.008$) (Table 16). A higher proportion of mothers of firstborn children (28.4%) were concerned that their preschooler's were consuming too few vegetables than mothers of laterborn children (14.5%). Beal (1980) has suggested that mothers of laterborn children have more realistic expectations of their children's vegetable eating behaviour, and are therefore less likely to be concerned if their preschooler expresses a dislike for vegetables.

Further, maternal concern about vegetable intake was not significantly related the respondent's place of residence, SES, occupational status, maternal education, family size, employment status, maternal age or the age of the child, concurring with the null hypotheses.

TABLE 15

Maternal Concern About Limited Vegetable Consumption In Relation To
Gender

Concern: Vegetables		Gender		
		Female	Male	TOTAL
Yes	n	19	29	48
	%	14.5	25.0	19.4
No	n	112	87	199
	%	85.5	75.0	80.6
TOTAL	n	131	116	247
	%	100.0	100.0	
% OF TOTAL		53.0	47.0	100.0

$$\chi^2 = 4.329; d.f. = 1; p = .03$$

TABLE 16 .

Maternal Concern About Limited Vegetable Consumption Of Preschool
Children In Relation To Birthrank

Concern: Vegetables		Birthrank		
		Firstborn	Laterborn	TOTAL
Yes	n	25	23	48
	%	28.4	14.5	19.4
No	n	63	136	199
	%	71.6	85.5	80.6
TOTAL	n	88	159	247
	%	100.0	100.0	
% OF TOTAL		35.6	64.4	100.0

$$\chi^2 = 7.035; d.f. = 1; p = .008$$

Maternal concern about limited vegetable intake was significantly related to concern about fussy eating habits ($X^2 = 50.481$; d.f.=1; p=.0001) (Table 17). The proportion of mothers concerned about fussy eating habits was higher for mothers concerned about vegetable intake (62.5%) than mothers not concerned about vegetable intake (14.1%). As several eating behaviour concerns were significantly related to fussy eating habits this relationship was examined in the presence of these variables. The relationship was still significant when concern about milk intake ($X^2 = 12.01$; d.f.=1; p=.0005), meat intake ($X^2 = 17.29$; d.f.=1; p=.0001), and limited amount of food consumed ($X^2 = 12.31$; d.f.=1; p=.0005) were controlled. Further, when maternal rating of appetite was controlled for, maternal concern about limited vegetable intake was still significantly related to concern about fussy eating habits ($X^2 = 29.27$; d.f.=1; p=.0001).

Further, there was a significant interaction between maternal concern about limited vegetable intake, fussy eating habits, and limited amount of food consumed ($X^2 = 6.28$; d.f.=1; p=.01) (Table 18) (Appendix E). Of mothers not concerned about fussy eating habits, those concerned about the total amount of food consumed were more likely to be concerned about limited vegetable intake (11:5) than mothers not concerned about the amount of food consumed (158:12). In contrast, of mothers concerned about fussy eating habits, a higher proportion of mothers not concerned about the amount of food consumed were also concerned about limited vegetable intake (21:24) compared to respondents concerned about the amount of food consumed (7:5).

In summary, demographic variables did not have a strong influence on maternal concern about limited vegetable intake. However, the re-

TABLE 17

Maternal Concern About Fussy Eating Habits In Relation To Concern About
Limited Vegetable Intake

Concern-Fussy Eating Habits		Concern-Vegetable Intake		
		Yes	No	TOTAL
Yes	n	30	28	58
	%	62.5	14.1	23.5
No	n	18	171	189
	%	37.5	85.9	76.5
TOTAL	n	48	199	247
	%	100.0	100.0	
% OF TOTAL		19.4	80.6	100.0

$$\chi^2 = 50.481; d.f. = 1; p = .0001$$

TABLE 18

Maternal Concern About Limited Vegetable Intake In Relation To Maternal
Concern About Fussy Eating Habits And Limited Total Food Intake

Sample	Fussy Habits	Limited ¹ Food	Limited Vegetables		TOTAL
			No	Yes	
1	No	No	158	12	170
2	No	Yes	11	5	16
3	Yes	No	21	24	45
4	Yes	Yes	7	5	12

¹ excludes 4 subjects concerned about excess food intake

$\chi^2 = 6.28; d.f. = 1; p = .01$

sults suggest that characteristics associated with the preschool child, such as gender and birthrank, are influencing the mothers' perception of whether their children are consuming enough vegetables. As maternal concern about limited vegetable intake was also significantly related to maternal concern about fussy eating habits and appetite rating (as referenced in 4.3), the results suggest that maternal concern about limited vegetable intake may result in concern about fussy eating habits and a poor appetite rating.

5.5.3 Dawdling

Of the mothers surveyed, 14.2% reported being concerned about dawdling. Eppright et al. (1969) reported a higher percentage of mothers of three year old children (44%) were concerned about dawdling.

Maternal concern about dawdling was significantly related to maternal employment status ($X^2 = 4.084; d.f. = 1; p = .01$), disagreeing with the proposed null hypothesis (Table 19). Mothers who were not employed outside the home were more likely to be concerned about dawdling (17.9%) than mothers who worked either full-time or part-time (8.8%). When SES ($X^2 = 4.33; d.f. = 1; p = .03$) education ($X^2 = 3.92; d.f. = 1; p = .04$), maternal age ($X^2 = 3.81; d.f. = 1; p = .01$), and place of residence ($X^2 = 4.05; d.f. = 1; p = .04$) were controlled, the relationship between employment status and maternal concern about dawdling was still significant.

When family size was controlled, the relationship between maternal employment status and concern about dawdling was no longer significant. However, this result may be explained by an interaction between employment status and family size, even though the interaction was not signif-

TABLE 19

Maternal Concern About Dawdling In Relation To Maternal Employment
Status

Concern- Dawdling		Employed		TOTAL
		Yes	No	
Yes	n	9	26	35
	%	8.8	17.9	14.2
No	n	93	119	212
	%	91.2	82.1	85.8
TOTAL	n	102	145	247
	%	100.0	100.0	
% OF TOTAL		41.1	58.9	100.0

$$\chi^2 = 4.084; d.f. = 1; p = .04$$

icant at the 5% level (Table 20). A higher proportion of non-employed mothers were concerned about dawdling than women who worked outside the home. However, while the same proportion of employed women with both large and small families were concerned about dawdling, a higher proportion of non-employed women with small families were concerned about dawdling.

Contrary to the findings of Eppright et al. (1969), maternal concern about dawdling was not related to the socioeconomic status of the family, family size, or birthrank. However, the results support the findings of Eppright et al. (1969) that maternal concern about dawdling was not related to the gender of the preschool child. Concern about dawdling was also not related to place of residence, education, maternal age, occupation, or the age of the child, supporting the projected hypothesis. Maternal concern about dawdling was not significantly related to any other eating behaviour concerns.

TABLE 20

Maternal Concern About Dawdling In Relation To Employment Status And
Family Size

Family ² Size	Employed ¹			
	YES		NO	
	Concern-Dawdling		Concern-Dawdling	
	Yes	No	Yes	No
Large	3	32	8	57
Small	6	61	18	62

¹ Yes=Fulltime+Parttime

² Large= 3-6 children Small= 1-2 children

5.5.4 Overconsumption Of High Sugar Foods

The overconsumption of high sugar foods was reported as a concern by 12.6% of the mothers. Eppright et al. (1969) reported a higher proportion of mothers (28.9%) worried that their preschooler's were eating too many sweets.

Maternal concern about the overconsumption of sweets was significantly related ($X^2 = 12.075; d.f. = 2; p = .002$) to the respondent's place of residence, not supporting the projected hypothesis (Table 21). A higher proportion of mothers residing in an urban centre (25.0%) were concerned that their children were consuming too many high sugar foods than respondents living in metropolitan (5.8%) and rural (15.9%) areas. When maternal education ($X^2 = 9.64; d.f. = 1; p = .001$), SES ($X^2 = 4.56; d.f. = 1; p = .03$), occupational status ($X^2 = 5.92; d.f. = 1; p = .01$), age ($X^2 = 8.90; d.f. = 1; p = .001$) and family size ($X^2 = 8.43; d.f. = 1; p = .003$) were controlled for, the relationship was still significant. These demographic variables were controlled as they may have been confounding the results because they were related to place of residence.

Further, maternal concern about excess sugar consumption was positively related to maternal education ($X^2 = 4.017; d.f. = 1; p = .04$) (Table 22). A higher proportion of more highly educated mothers were concerned that their children were consuming too many sweets than respondents with elementary or high school education (17.9% versus 9.2%). As maternal educational attainment was associated with place of residence, maternal age, occupational status, employment status, and family size, the relationship was considered in the presence of these variables. When place

TABLE 21

Maternal Concern About Excess Sugar Consumption In Relation To Place Of
Residence

Concern: Sugar Intake		Place of Residence			TOTAL
		M ¹	U ²	R ³	
Yes	n	7	11	13	31
	%	5.8	25.0	15.9	12.6
No	n	114	69	33	216
	%	94.2	75.0	84.1	87.4
TOTAL	n	121	80	46	247
	%	100.0	100.0	100.0	
% OF TOTAL		49.0	17.8	33.2	100.0

¹ M=metropolitan

² U=urban

³ R=rural

$\chi^2 = 12.075; d.f. = 2; p = .002$

of residence ($X^2 = 4.74; d.f. = 1; p = .02$), occupational status ($X^2 = 6.12; d.f. = 1; p = .01$) and maternal age ($X^2 = 3.81; d.f. = 1; p = .05$) were controlled, the relationship was still significant. Therefore, maternal concern about excess sugar consumption was positively related to maternal education, regardless of the above mentioned variables.

The relationship was no longer significant when examined in the presence of family size, and employment status. However, interactions between maternal education and family size, and maternal employment and family size were confounding the results, although the interactions were not significant. For example, there was an interaction between maternal education and family size (Table 23). The same proportion of more highly educated women with both large and small families were concerned about this issue. In contrast, a higher proportion of less educated mothers with large families mentioned this concern, compared to less educated women with small families. A similar interaction was observed between employment status and family size.

Maternal concern about excess sugar consumption was not related to employment status, SES, occupational status, family size, maternal age, nor the age, birthrank, and gender of the preschool child, supporting the proposed hypothesis. Maternal concern about excess sugar consumption was not significantly related to any of the eating behaviour concerns.

TABLE 22

Maternal Concern About Excess Sugar Consumption In Relation To Maternal
Education

Concern:		Maternal Education		
Sugar Intake		High School ¹		University ²
TOTAL				
Yes	n	14	17	31
	%	9.2	17.9	12.6
No	n	138	78	216
	%	90.8	82.1	87.5
TOTAL	n	152	95	247
	%	100.0	100.0	
% OF TOTAL		61.5	38.5	100.0

¹high school + elementary school

²university + college

$\chi^2 = 4.017; d.f. = 1; p = .04$

TABLE 23

Maternal Concern About Excess Sugar Intake In Relation To Maternal
Education And Family Size

Family ³ Size	Maternal Education			
	E+HS ¹		C+U ²	
	Concern-Sugar Y	Concern-Sugar N	Concern-Sugar Y	Concern-Sugar N
Small	7	86	10	44
Large	7	52	7	34

¹ elementary+high school
² college+university
³ Small= 1-2 children Large= 3-6 children

5.5.5 Limited Intake Of Food

Twenty-eight respondents (11.5%) reported that they were concerned that their preschool children were not consuming enough food. Eppright et al. (1969) reported a higher proportion of mothers concerned about this issue (28%). Further, 23% of the 448 mothers of children four years of age surveyed by Crawford et al. (1978) also wanted their children to eat more food. The smaller proportion of mothers of preschool

children in the present study who were concerned that their children were not eating enough food is consistent with the smaller percentage of mothers reporting their children's appetite to be inadequate. It is possible that mothers of preschool children in Manitoba are more knowledgeable about the physiological changes in growth that occur during the preschool years and thus are not concerned about their children's food intake. Supporting the null hypotheses, maternal concern about limited food intake was not related to SES, education, occupational status, family size, employment status, place of residence, maternal age, or the gender, age and birthrank of the preschool child.

Maternal concern about limited food intake was significantly related to maternal concern about limited vegetable intake ($X^2 = 5.804; d.f. = 1; p = .01$) (Table 24). The proportion of mothers concerned about limited food intake was higher for those concerned about vegetable intake (21.7%) than those not concerned about vegetable intake (9.1%). This relationship was considered in the presence of maternal rating of appetite and concern about limited meat and milk intake, and fussy eating habits as these variables were significantly related to maternal concern about limited vegetable intake. When these variables were controlled, the relationship was no longer significant.

In addition, maternal concern about limited food consumption was significantly related ($X^2 = 6.634; d.f. = 1; p = .01$) to maternal concern about fussy eating habits (Table 25). A higher proportion of mothers concerned that their children were not eating enough food were concerned about fussy eating habits (21.1%) than mothers not worried about total food intake (8.6%). When maternal concern about meat, milk and vegeta-

TABLE 24

Maternal Concern About Limited Food Intake In Relation To Concern About
Limited Vegetable Consumption

Concern- Limited Food		Concern-Limited Vegetable Intake		
		Yes	No	TOTAL
Yes	n	10	18	28
	%	21.7	9.1	11.5
No	n	36	179	215
	%	78.3	90.9	88.5
TOTAL	n	46	197	243 ¹
	%	100.0	100.0	
% OF TOTAL		18.9	81.1	100.0

¹ excludes 4 cases who were concerned about
excess consumption of food

$\chi^2 = 5.804; d.f. = 1; p = .01$

ble intake and maternal rating of appetite were controlled for, this relationship was no longer significant.

Statistical analysis indicated that there was a significant interaction between maternal concern about limited food consumption, fussy eating habits and limited intake of vegetables ($X^2 = 6.28; d.f. = 1; p = .01$) (Table 26) (Appendix F). Frequency counts for the combination of variables are presented in brackets. Of mothers who were not concerned about vegetable intake, respondents not concerned about fussy eating habits tended not to be concerned about limited food intake (158:11), while those concerned about fussy eating habits were more likely to be concerned about limited food intake (21:7). In contrast, of mothers concerned about vegetable intake, respondents concerned about fussy eating habits were less likely to be concerned about limited food intake (24:5) than mothers not concerned about fussy eating habits (12:5).

Further, maternal concern about limited food intake was significantly related ($X^2 = 5.286; d.f. = 1; p = .02$) to maternal concern about meat intake (Table 27). The proportion of mothers concerned about limited food intake was higher for those concerned about meat intake (26.1%) than those not concerned about meat intake (10.0%). As maternal concern about meat intake was significantly related to maternal appetite rating, fussy eating habits, and concern about limited vegetable intake, the relationship was considered in the presence of these variables. When maternal rating of appetite, and maternal concern about fussy eating habits and limited vegetable intake were considered, this relationship was no longer significant.

TABLE 25

Maternal Concern About Limited Food Intake In Relation To Concern About
Fussy Eating Habits

Concern- Limited Food		Concern-Fussy Eating Habits		
		Yes	No	TOTAL
Yes	n	12	16	28
	%	21.1	8.6	11.5
No	n	45	170	215
	%	78.9	91.4	88.5
TOTAL	n	57	186	243 ¹
	%	100.0	100.0	
% OF TOTAL		23.5	76.5	100.0

¹ excludes 4 cases who were concerned about
excess food consumption

$\chi^2 = 6.634; d.f. = 1; p = .01$

TABLE 26

Maternal Concern About Limited Food Intake In Relation To Maternal
Concern About Fussy Eating Habits and Limited Consumption Of Vegetables

Sample	Concern- Vegetables	Concern- Fussiness	Concern-Limited Food		TOTAL
			Yes	No ¹	
1	No	No	11	158	169
2	No	Yes	7	21	28
3	Yes	No	5	12	17
4	Yes	Yes	5	24	29

¹ excludes 4 subjects concerned about excess food intake

TABLE 27

Maternal Concern About Limited Total Food Intake In Relation To Concern
About Meat Consumption

Concern- Limited Food		Concern-Limited Meat Intake		TOTAL
		Yes	No ¹	
Yes	n	6	22	28
	%	26.1	10.0	11.5
No	n	17	198	215
	%	73.9	90.0	88.5
TOTAL	n	23	220	243 ²
	%	100.0	100.0	
% OF TOTAL		9.4	90.5	100.0

¹ includes 3 cases concerned about excess meat intake

²excludes 4 cases concerned about excess food intake

$\chi^2 = 5.286; d.f. = 1; p = .02$

Maternal concern about limited food intake was not significantly related to such eating behaviour concerns as milk intake, dawdling, and excess sugar consumption.

5.5.6 Meat Consumption

A concern that their children were not consuming enough meat was expressed by twenty-three of the mothers (9.3%). Eppright et al. (1969) found that 22.6% of mothers of two year old children reported the limited consumption of meat as an eating behaviour concern. Only three respondents (1.2%) were concerned that their children were consuming too much meat, confirming the findings of Eppright et al. (1969) that more mothers are concerned about limited intake than excess meat consumption. For statistical analysis, mothers concerned about both limited and excess meat consumption were combined into one group due to the small proportions in some categories.

Concern about meat intake was significantly related ($X^2 = 4.765; d.f. = 2; p = .03$) to the respondents' place of residence, not supporting the null hypothesis (Table 28). A higher proportion of metropolitan-residing mothers were concerned about their children's meat intake (14.9%) than respondents residing in non-metropolitan areas (6.4%). As several demographic variables were found to be related to the respondents' place of residence, the relationship was examined in the presence of these variables. This relationship was still significant when examined in the presence of SES ($X^2 = 4.08; d.f. = 1; p = .04$), and occupational status ($X^2 = 4.64; d.f. = 1; p = .03$).

TABLE 28

Maternal Concern About Total Meat Consumption In Relation To Place Of
Residence

Concern: Meat Intake		Place of Residence		TOTAL
		M ¹	U + R ²	
Yes	n	18	8	26 ³
	%	14.9	6.4	10.5
No	n	103	118	221
	%	85.1	93.6	89.5
TOTAL	n	121	126	247
	%	100.0	100.0	
% OF TOTAL		49.0	51.0	100.0

¹ M=metropolitan

² U+R=non-metropolitan

³ includes 3 subjects concerned about excess meat intake

$\chi^2 = 4.765; d.f. = 2; p = .03$

However, the relationship between place of residence and maternal concern about meat intake was no longer significant when maternal age, education, employment status and family size were controlled. Although not a significant interaction, the relationship between place of residence and maternal employment status was causing the relationship between maternal concern about meat intake and place of residence to be no longer significant (Table 29). When employment status was considered, the proportion of employed metropolitan mothers concerned about this eating behaviour was similar to the proportion of non-metropolitan residing non-employed mothers concerned about this issue.

TABLE 29

Maternal Concern About Meat Intake In Relation To Place Of Residence And
Maternal Employment Status

Employment Status	Place Of Residence			
	Metropolitan		Non-Metropolitan	
	Concern-Meat Yes	Concern-Meat No	Concern-Meat Yes	Concern-Meat No
Yes	6	50	1	45
No	12	53	7	73

Similarly, non-significant interactions between place of residence and maternal age, place of residence and maternal education, and place of residence and family size, were causing the relationship between maternal concern about meat intake and place of residence to be no longer significant.

Maternal concern about meat consumption was also related to maternal employment status ($X^2 = 3.979; d.f. = 1; p = .04$), disagreeing with the proposed hypothesis (Table 30). The proportion of mothers concerned about meat intake was higher for mothers who were not employed outside the home (13.8%) than for mothers who worked fulltime or part-time (5.9%). When the relationship between employment status and maternal concern about meat consumption was considered in the presence of the respondents' SES, occupational status, education, age, and family size, this relationship was no longer significant. Further, the relationship was no longer significant when place of residence was controlled due to the interaction between employment status and place of residence discussed previously.

The results of the study supported the hypothesis that eating behaviour concerns would not significantly related to SES, occupational status, maternal education, family size, and maternal age or the age, birthrank, gender of the preschool child.

Further, maternal concern about meat intake was significantly related ($X^2 = 9.711; d.f. = 1; p = .001$) to maternal concern about limited vegetable intake (Table 31). The proportion of mothers concerned about meat intake was higher for those concerned about limited vegetable intake (22.9%) than for those not concerned about vegetable consumption (7.5%).

TABLE 30

Maternal Concern About Total Meat Consumption In Relation To Maternal
Employment Status

Concern: Meat Intake		Employed		TOTAL
		Yes ¹	No	
Yes	n	6	20	26 ²
	%	5.9	13.8	10.5
No	n	96	125	221
	%	94.1	86.2	89.5
TOTAL	n	102	145	247
	%	100.0	100.0	
% OF TOTAL		41.3	58.7	100.0

¹ Fulltime + Parttime

² includes 3 subjects concerned about excess meat intake

$\chi^2 = 3.979; d.f. = 1; p = .04$

This relationship was still significant when examined in the presence of maternal concern about amount of food consumed ($X^2 = 4.74$; d.f. = 1; $p = .02$). However, when maternal concern about fussy eating habits, limited milk intake and maternal rating of appetite were controlled, this relationship was no longer significant, suggesting that maternal concern about meat intake is related to these variables.

In addition, maternal concern about meat intake was significantly related ($X^2 = 5.027$; d.f. = 1; $p = .02$) to maternal concern about amount of food consumed (Table 32). A higher proportion of mothers concerned about their children's total food intake were worried about their children's meat intake (21.9%) than respondents not worried about total food intake (8.8%). This relationship was no longer significant when examined in the presence of maternal rating of appetite and maternal concern about fussy eating habits, and limited vegetable intake, variables significantly related to maternal concern about the amount of food consumed.

Maternal concern about meat intake was also significantly related ($X^2 = 5.731$; d.f. = 1; $p = .01$) to maternal concern about fussy eating habits (Table 33). A higher proportion of mothers concerned about fussy eating habits were concerned about meat intake (19.0%) than respondents not worried about fussy eating habits (7.9%). When this relationship was examined in the presence of appetite rating, and maternal concern about limited food and vegetable intake, and milk intake, it was no longer significant.

Maternal concern about the amount of meat consumed was not significantly related to concern about dawdling, milk intake, or excess sweet intake.

TABLE 31

Maternal Concern About Meat Intake In Relation To Concern About Limited
Vegetable Consumption

Concern: Meat Intake		Concern-Vegetable Intake		
		Yes	No	TOTAL
Yes	n	11	15	26 ¹
	%	22.9	7.5	10.5
No	n	37	184	221
	%	77.1	92.5	89.5
TOTAL	n	48	199	247
	%	100.0	100.0	
% OF TOTAL		19.4	80.6	100.0

¹ includes 3 subjects concerned about excess meat intake
 $\chi^2 = 9.711; d.f.=1; p=.001$

TABLE 32

Maternal Concern About Total Meat Intake In Relation To Concern About
Total Food Intake

Concern: Meat Intake		Concern-Total Food Intake		
		Yes ¹	No	TOTAL
Yes	n	7	19	26 ²
	%	21.9	8.8	10.5
No	n	25	196	221
	%	78.1	91.2	89.5
TOTAL	n	32	215	247
	%	100.0	100.0	
% OF TOTAL		13.0	87.0	100.0

¹ includes 4 subjects concerned about excess food intake

² includes 3 subjects concerned about excess meat intake

$\chi^2 = 5.027; d.f. = 1; p = .02$

TABLE 33

Maternal Concern About Total Meat Intake In Relation To Maternal Concern
About Fussy Eating Habits

Concern: Meat Intake		Concern-Fussy Eating Habits		
		Yes	No	TOTAL
Yes	n	11	15	26 ¹
	%	19.0	7.9	10.5
No	n	47	174	221
	%	81.0	92.1	89.5
TOTAL	n	58	189	247
	%	100.0	100.0	
% OF TOTAL		23.5	76.5	100.0

¹ includes 3 subjects concerned about excess meat intake
 $\chi^2 = 5.731; d.f. = 1; p = .01$

5.5.7 Milk Consumption

Seventeen mothers (6.9%) reported that they were concerned that their children were not drinking enough milk. Only 0.8% of the mothers surveyed were concerned that their preschoolers' were drinking too much milk. The results agree with the findings of Eppright et al. (1969) that more mothers are concerned that their children are not consuming enough milk compared to mothers worried about excess consumption. However, Eppright et al. (1969) reported a higher percentage of mothers (20.1%) concerned about limited milk intake than in the present study. For statistical analysis, mothers concerned about milk intake - too much milk and too little milk - were combined into one group.

The results supported the hypothesis that maternal concern about milk intake would not be not related to place of residence, employment status, maternal age, SES, occupational status, maternal education, family size, or the age, birthrank, and gender of the child.

Maternal concern about milk consumption was significantly related ($X^2 = 3.984; d.f. = 1; p = .04$) to maternal concern about limited vegetable intake (Table 34). The proportion of mothers concerned about milk consumption was higher among those concerned about vegetable intake (14.6%) than those not concerned about vegetable consumption (6.0%).

When maternal rating of appetite and maternal concern about fussy eating habits, meat intake, or total food consumed, were controlled for, this relationship was no longer significant, showing that these variables were interrelated.

TABLE 34

Maternal Concern About Total Milk Intake In Relation To Concern About
Limited Vegetable Consumption

Concern: Milk Intake		Concern-Vegetable Intake		
		Yes	No	TOTAL
Yes	n	7	12	19 ¹
	%	14.6	6.0	7.7
No	n	41	187	228
	%	85.4	94.0	92.3
TOTAL	n	48	199	247
	%	100.0	100.0	
% OF TOTAL		19.4	80.6	100.0

¹ includes 2 subjects concerned about excess milk intake
 $\chi^2 = 3.984; d.f. = 1; p = .04$

However, there was an interaction between maternal concern about milk consumption, limited vegetable intake, and maternal rating of appetite ($X^2 = 3.93; d.f. = 1; p = .04$) (Table 35) (Appendix G). Of mothers who were not concerned about vegetable intake, respondents who rated appetite as "fair" or "poor" were more likely to be concerned about milk intake (6:38) than mothers who rated appetite "good" or "very good" (5:150). In contrast, a different trend was evident for mothers who were concerned about limited vegetable consumption. Mothers who rated appetite "fair" or "poor" were less likely to be concerned about milk intake (3:27) than mothers who rated appetite "very good" or "good" (3:15).

Further, maternal concern about limited milk intake was significantly related to maternal concern about fussy eating habits ($X^2 = 3.973; d.f. = 1; p = .04$). (Table 36). A higher proportion of mothers concerned about fussy eating habits were concerned about milk intake (13.8%) than mothers not concerned about fussy eating habits (5.8%). This relationship was no longer significant when examined in the presence of maternal rating of appetite and maternal concern about limited vegetable intake, amount of food consumed, and meat intake.

Maternal concern about milk intake was not significantly related to maternal concern about dawdling, meat intake, total food consumed, or excess sugar intake.

TABLE 35

Maternal Concern About Milk Consumption In Relation To Maternal Rating
Of Appetite and Concern About Limited Vegetable Intake

Sample	Concern		Concern-Milk Intake		
	Vegetables ¹	Appetite ²³	Yes ⁴	No	TOTAL
1	No	Fair	6	38	44
2	No	Good	6	150	156
3	Yes	Fair	4	27	31
4	Yes	Good	3	15	18

¹ Yes=concerned about limited vegetable intake

² Good=Good + Very Good

³ Fair=Fair + Poor

⁴ includes too subjects concerned about excess intake

TABLE 36

Maternal Concern About Milk Intake In Relation To Maternal Concern About
Fussy Eating Habits

Concern: Milk Intake		Concern-Fussy Eating Habits		
		Yes	No	TOTAL
Yes	n	8	11	19 ¹
	%	13.8	5.8	7.7
No	n	50	178	228
	%	86.2	94.2	92.3
TOTAL	n	58	189	247
	%	100.0	100.0	
% OF TOTAL		23.5	76.5	100.0

¹ includes 2 subjects concerned about excess milk intake
 $\chi^2 = 3.973; d.f. = 1; p = .04$

5.5.8 Other Eating Behaviour Concerns

Other eating behaviour concerns mentioned by the mothers included, in descending order of frequency; food jags (N=6); consumption of too much juice (N=3); consumption of too many snacks (N=3); constipation (N=2); dislike of eggs (N=2); weight control (N=2); consumption of too many "junk" foods (N=1); consumption of too much bread (N=1); hyperactivity (N=1); iron-deficiency anemia (N=1); and the consumption of too much fat (N=1).

The results of the current research indicate that mothers of preschool children are concerned about the same eating behaviours documented by Beal (1957), Eppright et al. (1969) and Metheny et al. (1962a). However, a smaller percentage of mothers were concerned that their children were consuming too little food, too few vegetables, meat, and milk, consuming too many sweets, and about fussy eating habits and dawdling than previously noted by Eppright et al. (1969). It could be speculated that nutrition education has resulted in most mothers having more realistic expectations about their children's food requirements. For example, several of the mothers stated that previously they had been worried about limited vegetable consumption but had discussed the problem with their physician or another mother and now realized that this eating behaviour was fairly typical of young children. Nevertheless, many mothers still require further nutrition education in this area. Although demographic variables were not generally important factors influencing maternal eating behaviour concerns, mothers residing in non-metropoli-

tan areas and well-educated women require assurance about excess sugar consumption and women not employed outside the home require information on dawdling. Characteristics associated with the child such as gender and birthrank are influencing maternal concern about limited vegetable intake.

Alternatively, differences between the current study and previous research conducted in the 1950's and 1960's could be explained by several factors. Firstly, the surveys by Eppright et al. (1969), Metheny et al. (1962a) and Beal (1957) were conducted over twenty years ago. Secondly, there may be differences between Manitoban and American mothers. In addition, the questions were asked differently in each survey which may have influenced the results. Finally, Beal (1957) and Metheny et al. (1962a) did not survey a random sample of preschool children.

It is evident that many of the eating behaviour concerns expressed by the mothers were interrelated. Mothers concerned about either total amount of food consumed, meat intake, or milk intake, also tended to be concerned about fussy eating habits and limited vegetable consumption. Therefore, mothers concerned about any one of the above mentioned concerns were also likely to be concerned about several aspects of their children's eating behaviour. In contrast, mothers who were concerned about dawdling and excess sugar intake were not as likely to also be concerned about other eating behaviours. The results suggest that if mothers are concerned about the adequacy of their child's diet, expressed in a concern about total food consumed, then they will also be concerned about fussy eating habits, limited vegetable intake, and meat intake. Therefore, educating parents to have a more realistic concept

of the amount of food a preschool child can be expected to consume may help in alleviating the majority of maternal concerns about preschool children's eating behaviour.

5.6 MATERNAL RATING OF PRESCHOOL CHILDREN'S APPETITE

The majority of the children (69.6%) were perceived by their mothers to have a "very good" or "good" appetite (Table 37). However, 30.0% of the children were considered to have a "fair" or "poor" appetite.

TABLE 37

Maternal Rating of Prechool Children's Appetite

Appetite Rating	Number Of Subjects	Percent Of Subjects
Very Good	68	27.5
Good	105	42.1
Fair	61	24.7
Poor	13	5.3
TOTAL	247	100.0

The results are similar to the findings of McNeil (1982) who found that more mothers of the 43 preschool children surveyed rated thair

children's appetite as "good" (66%) than "fair" (30%) or "poor" (4%). The results also concur with the findings of Beal (1957) who found that at three to four years of age, 40% of the 65 children surveyed had appetites reported to be "fair", "poor", or "very poor". Despite the poor appetite rating, Beal (1957) found that the children's nutrient intake, on average, met recommended nutrient needs.

Maternal rating of appetite was not significantly related to SES, occupational status, maternal education, place of residence, maternal age, employment status, family size, or the birthrank, gender, and age of the preschool child, supporting the hypothesis.

Contrary to the formulated hypothesis, maternal ratings of appetite were significantly related to several maternal concerns about children's eating behaviour. Appetite ratings were significantly related to maternal concern about fussy eating habits ($X^2 = 37.331; d.f. = 3; p = .0001$) (Table 38). The proportion of mothers who rated appetite "fair" was higher (45.0%) for mothers concerned about fussy eating habits than mothers not concerned about fussy eating habits (18.5%). This relationship was still significant when maternal concern about milk intake ($X^2 = 5.77; d.f. = 1; p = .01$) and meat intake ($X^2 = 9.10; d.f. = 1; p = .0002$) were controlled. However, the relationship was no longer significant when considered in the presence of maternal concern about limited vegetable intake and limited food intake.

In addition, maternal concern about limited vegetable consumption was significantly related ($X^2 = 30.064; d.f. = 1; p = .0001$) to appetite rating (Table 39). A higher proportion of mothers concerned about limited vegetable intake rated appetite "fair" or "poor" (62.5%) than mothers not concerned about limited vegetable intake (22.1%). This relationship was

TABLE 38

Maternal Rating Of Appetite In Relation To Maternal Concern About Fussy
Eating Habits

Appetite Rating		Concern-Fussy Eating Habits		
		Yes	No	TOTAL
Very Good	n	3	65	68
	%	5.1	34.4	27.5
Good	n	21	84	105
	%	37.1	44.4	42.5
Fair	n	26	35	61
	%	45.0	18.5	24.7
Poor	n	8	5	13
	%	13.8	2.7	5.3
TOTAL				
	n	58	189	247
	%	100.0	100.0	
% OF TOTAL		23.5	76.5	100.0

$\chi^2 = 37.331; d.f. = 3; p = .0001$

still significant when maternal concern about limited food intake was controlled ($X^2 = 5.15; d.f. = 1; p = .02$). However, the relationship was no longer significant when considered in the presence of maternal concern about fussy eating habits, meat intake, and milk intake.

Maternal concern about dawdling was also significantly related to maternal rating of appetite ($X^2 = 20.056; d.f. = 3; p = .002$) (Table 40). A higher proportion of mothers concerned about dawdling rated their child's appetite as "poor" (11.4%) than mothers not concerned about dawdling (3.8%).

Further, maternal rating of appetite was significantly related to maternal concern about amount of food consumed ($X^2 = 26.362; d.f. = 1; p = .0001$) (Table 41). A higher proportion of mothers concerned about the amount of food their child consumed rated appetite as "fair" or "poor" (68.8%) than mothers not concerned about the amount of food consumed (24.1%). This relationship was still significant when considered in the presence of maternal concern about limited vegetable intake ($X^2 = 12.07; d.f. = 1; p = .0005$), fussy eating habits ($X^2 = 14.94; d.f. = 1; p = .0001$), and meat intake ($X^2 = 9.19; d.f. = 1; p = .002$).

Maternal rating of appetite was also significantly related to maternal concern about meat intake ($X^2 = 10.651; d.f. = 1; p = .001$) (Table 42). A higher proportion of mothers concerned about meat intake rated appetite "fair" or "poor" (57.7%) than mothers not concerned about meat intake (26.7%). When considered in the presence of maternal concern about fussy eating habits, the relationship was still significant ($X^2 = 5.12; d.f. = 1; p = .02$). This relationship was no longer significant when maternal concern about limited food intake and limited vegetable intake were controlled.

TABLE 39

Maternal Rating Of Preschool Children's Appetite In Relation To Maternal
Concern About Limited Vegetable Intake

Appetite Rating ¹²		Concern-Vegetable Intake		
		Yes	No	TOTAL
Fair	n	30	44	74
	%	62.5	22.1	30.0
Good	n	18	155	173
	%	37.5	77.9	70.0
TOTAL	n	48	199	247
	%	100.0	100.0	
% OF TOTAL		19.4	80.6	100.0

¹ Fair=Fair + Poor

² Good=Good + Very Good

$\chi^2 = 30.064; d.f. = 1; p = .0001$

TABLE 40

Maternal Rating Of Appetite In Relation To Maternal Concern About
Dawdling

Appetite Rating		Concern-Dawdling		TOTAL
		Yes	No	
Very Good	n	2	66	68
	%	5.7	31.1	27.5
Good	n	12	93	105
	%	34.4	45.3	42.5
Fair	n	17	44	61
	%	48.5	20.8	24.7
Poor	n	4	9	13
	%	11.4	3.8	5.3
TOTAL				
	n	35	212	247
	%	100.0	100.0	
% OF TOTAL		14.2	85.8	100.0

$$X^2 = 20.056; d.f. = 3; p = .002$$

TABLE 41

Maternal Rating Of Appetite In Relation To Maternal Concern About The
Amount Of Food Consumed By Preschool Children

Appetite ¹ Rating	Concern-Amount Of Food			TOTAL
		Yes ²	No	
Good	n	10	163	173
	%	31.2	75.8	70.0
Fair	n	22	52	74
	%	68.8	24.1	30.0
TOTAL	n	32	215	247
	%	100.0	100.0	
% OF TOTAL		13.0	87.0	100.0

¹ Good=Very Good+Good Fair=Fair+Poor

² includes 4 cases concerned about excess food intake

$\chi^2 = 26.362; d.f. = 1; p = .0001$

TABLE 42

Maternal Rating Of Appetite In Relation To Maternal Concern About Meat Intake

Appetite ¹ Rating		Concern-Meat Intake		
		Yes ²	No	TOTAL
Good	n	11	162	1733
	%	42.3	73.3	70.0
Fair	n	15	59	74
	%	57.7	26.7	30.0
TOTAL	n	26	221	247
	%	100.0	100.0	
% OF TOTAL		10.5	89.5	100.0

¹ Good=Very Good+Good Fair=Fair+Poor

² includes 3 subjects concerned about excess intake of meat

$\chi^2 = 10.651; d.f. = 1; p = .001$

Appetite ratings were also significantly related ($\chi^2 = 5.041$; d.f.=1; $p=.02$) to maternal concern about milk intake (Table 43). A higher proportion of mothers concerned about milk intake rated appetite as "fair" or "poor" (52.6%) than mothers not concerned about milk intake (28.1%). This relationship was no longer significant when considered in the presence of maternal concern about fussy eating habits and limited vegetable intake.

Of the eating behaviour concerns, concern about excess sugar intake was the only concern not significantly related to appetite rating. As maternal concern about excess sugar intake was the only concern focused on excess intake of food, the results suggest that appetite rating may be a consequence of maternal concern about inadequate food intake, both total amount of food and the intake of specific foods (meat, milk, and vegetables).

In summary, mothers who rated their children's appetite as "fair" or "poor" were not characterized by specific demographic traits. However, maternal rating of appetite was significantly related to all of the major eating behaviour concerns, with the exception of concern about excess sugar consumption. Mothers who perceived their preschoolers' to have "fair" or "poor" appetites tended to be concerned about limited amount of food consumed by their children, in general, and limited vegetable, meat, and milk intake, in particular. Mothers concerned about dawdling and fussy eating habits also tended to perceive their children to have "fair" or "poor" appetites. The first four concerns focus on an inadequate intake of food - as perceived by the parent. These concerns may result in mothers also being concerned about fussy eating habits and

TABLE 43

Maternal Rating Of Appetite In Relation To Maternal Concern About Milk Intake

Appetite ¹		Concern-Milk Intake		TOTAL
		Yes ²	No	
Rating				
Good	n	9	164	173
	%	47.7	71.9	70.0
Fair	n	10	64	74
	%	52.6	28.1	30.0
TOTAL	n	19	228	247
	%	100.0	100.0	
% OF TOTAL		7.7	92.3	100.0

¹ Good=Very Good+Good Fair=Fair+Poor

² includes 2 subjects concerned about excess intake of milk

$\chi^2 = 5.041; d.f. = 1; p = .02$

dawdling. It could be speculated that a poor appetite rating is a consequence of maternal eating behaviour concerns associated with inadequate amounts of food eaten (including the total amount and of specific food), and how the foods are consumed (fussy eating and dawdling).

5.7 MATERNAL PERCEPTION OF PRESCHOOL CHILDREN'S WILLINGNESS TO EAT

The majority of mothers (82.9%) perceived their children to be willing to eat "always" or "most of the time" (Table 44). However, 17.1% stated that their children were willing to eat only "some of the time" or "rarely". Metheny et al. (1962a) found a similar proportion (24%) of the 96 children they surveyed were not always willing to eat or were generally finicky about most foods (6.0%). However, Eppright et al. (1969) reported a higher percentage of mothers of three year old children (75%) considered their preschoolers' to be generally disinterested in food. Differences in the way the question was asked may have influenced the results.

Maternal rating of children's willingness to eat was combined into two groups, "most of the time" ("always" plus "most of time") and "sometimes" ("sometimes" plus "rarely"), for statistical analysis.

Supporting the formulated null hypotheses, maternal ratings of willingness to eat were not related to SES, occupational status, place of residence, employment status, maternal age, family size, maternal education, nor gender, birthrank and age of the child.

Maternal rating of children's willingness to eat was significantly related to maternal ratings of appetite ($X^2 = 36.562; d.f. = 1; p = .0001$) (Table 45). A higher proportion of mothers who rated their children's ap-

TABLE 44

Maternal Rating Of Preschool Children's Willingness To Eat

Willingness	Number Of Subjects ¹	Percent Of Subjects
Always	52	21.1
Most Of Time	152	61.8
Sometimes	38	15.5
Rarely	4	1.6
TOTAL	246	100.0

¹ excludes one case in which a value was not available

petite "fair" or "poor" perceived their preschooler to be generally unwilling to eat (39.2%) than mothers who rated their children's appetite "good" or "very good" (7.6%). As maternal rating of appetite was significantly related to several maternal eating behaviour concerns, the relationship between willingness to eat and appetite rating was examined in the presence of these variables. When maternal concern about limited food intake ($X^2 = 7.23; d.f.=1; p=.007$), meat intake ($X^2 = 13.09; d.f.=1; p=.03$), milk intake ($X^2 = 6.79; d.f.=1; p=.04$), dawdling ($X^2 = 15.02; d.f.=1; p=.03$), vegetable intake ($X^2 = 15.73; d.f.=1; p=.0008$), and

fussy eating habits ($X^2 = 17.52; d.f. = 1; p = .0001$) were controlled, the relationship between maternal rating of willingness to eat and maternal rating of appetite was still significant. Therefore, the relationship between maternal ratings of willingness to eat and appetite was not significantly influenced by any maternal eating behaviour concerns. It could be speculated that maternal rating of willingness to eat and maternal rating of appetite are two attempts to measure the same concept.

Further, maternal rating of willingness to eat was significantly related to several maternal eating behaviour concerns, contrary to the formulated null hypothesis. Maternal rating of children's willingness to eat was significantly related to maternal concern about amount of food consumed. ($X^2 = 31.669; d.f. = 1; p = .0001$) (Table 46). A higher proportion of respondents who rated their children as generally unwilling to eat were concerned about their preschoolers' food intake (26.2%) compared to mothers who perceived their children as generally willing to eat (10.3%). When maternal rating of appetite was controlled, the relationship between maternal rating of willingness to eat and maternal concern about total food intake was no longer significant. However, the relationship was still significant when considered in the presence of other maternal concerns associated with maternal concern about the amount of food consumed, including concern about meat intake ($X^2 = 9.50; d.f. = 1; p = .002$), vegetable intake ($X^2 = 6.17; d.f. = 1; p = .01$) and fussy eating habits ($X^2 = 3.76; d.f. = 1; p = .05$).

Further, maternal rating of preschool children's willingness to eat was significantly related to maternal concern about fussy eating habits ($X^2 = 31.669; d.f. = 1; p = .0001$) (Table 47). Mothers who were concerned

TABLE 45

Maternal Rating Of Willingness To Eat In Relation To Maternal Rating Of
Appetite

Willingness To Eat		Appetite Rating		TOTAL
		Good ¹	Fair ²	
Most Of Time	n	159	45	204
	%	92.4	60.8	82.9
Sometimes	n	13	29	42
	%	7.6	39.2	17.1
TOTAL	n	172	74	246 ³
	%	100.0	100.0	
% OF TOTAL		69.9	30.1	100.0

¹ Very Good + Good

² Fair + Poor

³ excludes one case in which a value was not available

$\chi^2 = 36.562; d.f. = 1; p = .0001$

TABLE 46

Maternal Rating Of Preschool Children's Willingness To Eat In Relation
To Concern About Total Food Intake

Concern About Amount of Food		Willingness To Eat		
		Most Of Time	Sometimes	TOTAL
Yes	n	21	11	32 ¹
	%	10.3	26.2	13.0
No	n	183	31	214
	%	89.7	73.8	87.0
TOTAL	n	204	42	246 ²
	%	100.0	100.0	
% OF TOTAL		82.9	17.1	100.0

¹ includes 4 cases concerned about excess food intake

²excludes one case in which a value was not available

$\chi^2 = 31.669; d.f. = 1; p = .0001$

about fussy eating habits were more likely to rate their children generally unwilling to eat (41.4%) than respondents not concerned about fussy eating habits (9.6%). When maternal rating of appetite was controlled, this relationship was still significant ($X^2=12.92$;d.f.=1;p=.0003). Further, this relationship was still significant when examined in the presence of concern about the amount of food consumed ($X^2=17.98$;d.f.=1;p=.001), meat intake ($X^2=10.52$;d.f.=1;p=.001), milk intake ($X^2=10.98$;d.f.=1;p=.003), and limited vegetable intake ($X^2=14.01$;d.f.=1;p=.0002).

In addition, maternal rating of willingness to eat was significantly related ($X^2=8.466$;d.f.=1;p=.003) to maternal concern about limited intake of vegetables (Table 48). A higher proportion of mothers concerned about vegetable intake rated their children as willing to eat only some of the time (31.3%) compared to respondents who were not concerned about vegetable intake (13.6%). When maternal rating of appetite and maternal concern about fussy eating habits, milk intake, meat intake, and the amount of food consumed were controlled, the relationship was no longer significant.

Maternal rating of preschool children's willingness to eat was significantly related to maternal concern about dawdling ($X^2=28.595$;d.f.=1;p=.0001) (Table 49). A higher proportion of mothers concerned about dawdling rated their children as generally unwilling to eat (48.6%) compared to mothers not concerned about dawdling (11.8%). When maternal rating of appetite was controlled, this relationship was still significant ($X^2=13.66$;d.f.=1;p=.0002).

The results of the present study suggest that most preschool children are generally willing to eat at mealtime, but that 15.5% were willing to eat only some of the time. Few children were generally resistant to eating. Demographic variables were not associated with maternal rat-

TABLE 47

Maternal Rating Of Preschool Children's Willingness To In Relation To
Maternal Concern About Fussy Eating Habits

Willingness To Eat	Concern-Fussy Eating Habits			TOTAL
		Yes	No	
Most Of Time	n	34	170	204
	%	58.6	90.4	82.9
Sometimes	n	24	18	42
	%	41.4	9.6	17.1
TOTAL	n	58	188	246 ¹
	%	100.0	100.0	
% OF TOTAL		23.6	76.4	100.0

¹ excludes one case for which a value was not available

$\chi^2 = 31.669; d.f. = 1; p = .0001$

TABLE 48

Maternal Rating Of Preschool Children's Willingness To Eat In Relation
To Maternal Concern About Limited Vegetable Intake

Willingness To Eat		Concern About Vegetables		
		Yes	No	TOTAL
Most Of Time	n	33	171	204
	%	68.7	86.4	82.9
Sometimes	n	15	27	42
	%	31.3	13.6	17.1
TOTAL	n	48	198	246 ¹
	%	100.0	100.0	
% OF TOTAL		19.5	80.5	100.0

¹ excludes one case for which a value was not available

$\chi^2 = 8.466; d.f. = 1; p = .003$

TABLE 49

Maternal Rating Of Preschool Children's Willingness To Eat In Relation
To Maternal Concern About Dawdling

Willingness To Eat	Concern About Dawdling			
		Yes	No	TOTAL
Most Of Time	n	18	186	204
	%	51.4	88.2	82.9
Sometimes	n	17	25	41
	%	48.6	11.8	16.9
TOTAL	n	35	211	246 ¹
	%	100.0	100.0	
% OF TOTAL		14.2	85.8	100.0

¹ excludes one case for which a value was not available

$\chi^2 = 28.595; f.d. = 1; p = .0001$

ing of willingness to eat. However, willingness rating was significantly related to maternal concerns about dawdling, limited vegetable intake, fussy eating habits, and total food intake. The results suggest that maternal rating of willingness to eat may be a consequence of maternal eating behaviour concerns that focus on inadequate food intake, as well as concern about dawdling and fussy eating habits. The relationship between willingness rating and maternal concern about dawdling and fussy eating habits was still significant when maternal rating of appetite was controlled. Further, since maternal rating of appetite was influenced by the same eating behaviour concerns as the willingness to eat rating, and since the willingness and appetite ratings were significantly related, the two ratings may be measuring the same concept, although the instrument was not precise enough to verify this. Alternatively, maternal ratings of appetite and willingness to eat may be two different but closely related concepts.

5.7.1 Maternal Practices Employed To Encourage Preschool Children To Eat

To assess the practices employed by mothers to encourage eating when children are unwilling to eat, the respondents were asked what they said or did under such situations (Table 50). Of the 194 respondents who stated that their children were not always willing to eat, 47% reported that they generally ignored the situation and did not attempt to encourage their children to eat. Many of these mothers stated they they did not try to push food on their children. Similar results were reported by Eppright et al. (1969) who found that 46% of the mothers surveyed stated that they did not encourage their children to eat.

While it is encouraging to note that many mothers were responding with the appropriate behaviour when their children did not wish to eat, many of the respondents did report employing a variety of questionable practices to encourage their children to consume more food. Analysis was therefore conducted to determine if inappropriate practices employed by mothers were characterized by specific demographic variables or eating behaviour concerns.

The majority of the mothers (53.1%) stated that they attempted to encourage their preschoolers to eat through verbal coaxing. The results suggest a trend for more mothers to coax their children as both Eppright et al. (1969) and Metheny et al. (1962a) reported a lower percentage of mothers coaxed their children to eat, 14% and 15% respectively.

The maternal practice of coaxing preschool children to eat was significantly related to the respondents' place of residence ($X^2 = 11.298; d.f. = 2; p = .003$) (Table 51). A higher proportion of rural (53.7%) and urban (50.0%) mothers coaxed their children to eat compared to city-dwelling mothers (31.4%). When education ($X^2 = 10.24; d.f. = 1; p = .001$), occupational status ($X^2 = 8.27; d.f. = 1; p = .004$), maternal age ($X^2 = 10.43; d.f. = 1; p = .01$), employment status ($X^2 = 12.04; d.f. = 1; p = .0005$), SES ($X^2 = 10.00; d.f. = 1; p = .001$) and family size ($X^2 = 10.15; d.f. = 1; p = .001$) were controlled, this relationship was still significant.

The maternal practice of coaxing preschool children to eat was not significantly related to the respondents' SES, education, age, employment status, occupation status, family size, nor the age, gender and birthrank of the respondents' preschool children.

TABLE 50

Maternal Practices Employed To Encourage Preschool Children To Eat,
N=194

Practice	N	% ¹
Encourage/Coax	104	53.6
Ignore	91	46.9
Food Reward/Deprivation	47	24.2
Substitute Liked Food	34	17.5
Remove Food From Table	19	9.8
Give More Snacks	15	7.7
Place Food In Mouth	14	7.2
Make Sit At Table	6	3.1
Demand To Eat	4	2.1
Non-Food Reward/Deprivation	3	1.5
Give More Fluids	3	1.5
Send To Room	1	0.5

¹ totals to more than 100% due to multiple responses

TABLE 51

Maternal Practice Of Coaxing Preschool Children To Eat In Relation To
Place Of Residence

Coaxes To Eat		Place Of Residence			TOTAL
		M ¹	U ²	R ³	
Yes	n	38	22	44	104
	%	31.4	50.0	53.7	42.1
No	n	83	22	38	143
	%	68.6	50.0	46.3	57.9
TOTAL	n	121	44	82	247
	%	100.0	100.0	100.0	
% OF TOTAL		49.9	17.8	33.2	100.0

¹ M=Metropolitan

² U=Urban

³ R=Rural

$\chi^2 = 11.298; d.f. = 2; p = .003$

In addition, as it could be speculated that maternal eating behaviour concerns could influence the practices implemented to encourage children to eat, the interrelationships between these variables were examined.

The maternal practice of coaxing preschool children to eat was significantly related to maternal rating of appetite ($X^2 = 11.099$; d.f.=1; p=.0009) (Table 52). Mothers who rated their children's appetite "fair" or "poor" were more likely to coax their children to eat (58.1%) than respondents who considered their children's appetite to be "good" or "very good" (35.3%). The relationship was still significant when maternal concern about dawdling ($X^2 = 5.47$; d.f.=1; p=.01) and milk intake ($X^2 = 5.31$; d.f.=1; p=.02) were controlled. However, when maternal concern about vegetable, meat, and total food intake, and fussy eating habits were controlled this relationship was no longer significant.

Further, there was a significant interaction between the maternal practice of coaxing children to eat, maternal appetite rating, and maternal concern about limited vegetable intake ($X^2 = 8.11$; d.f.=1; p=.0044) (Table 53) (Appendix H). Of mothers who rated their child's appetite "fair" or "poor", respondents concerned about vegetable intake were less likely to coax their children to eat (16:14) than respondents not concerned about vegetable intake (27:17). In contrast, of mothers who rated their child's appetite as "good" or "very good", a higher proportion of mothers concerned about vegetable intake coaxed their children to eat (13:5) than mothers not concerned about vegetable intake (48:107).

The maternal practice of coaxing unwilling children to eat was also significantly related ($X^2 = 6.465$; d.f.=1; p=.01) to the absence of mater-

TABLE 52

Maternal Practice of Coaxing Preschool Children To Eat In Relation To
Maternal Rating Of Appetite

Coaxes To Eat		Appetite Rating		TOTAL
		Good ¹	Fair ²	
Yes	n	61	43	104
	%	35.3	58.1	42.1
No	n	112	31	143
	%	64.7	41.9	57.9
TOTAL	n	173	74	247
	%	100.0	100.0	
% OF TOTAL		70.0	30.0	100.0

¹ Very Good + Good

² Fair + Poor

$\chi^2 = 11.099; d.f. = 1; p = .0009$

TABLE 53

Maternal Practice Of Coaxing Preschool Children To Eat In Relation To
Maternal Rating Of Appetite And Maternal Concern About Limited Vegetable
Intake

Sample	Appetite ¹	Concern- Vegetables	Coaxes		TOTAL
	Rating		No	Yes	
1	Fair	No	17	27	44
2	Fair	Yes	14	16	30
3	Good	No	107	48	155
4	Good	Yes	5	13	18

¹ Fair=Fair+Poor Good=Good+Very Good

nal eating behaviour concerns (Table 54). Mothers who reported being concerned about their children's eating behaviour were more likely to coax their children to eat (48.4%) than respondents who were not concerned about their preschoolers' eating habits (31.9%).

There was also a significant relationship ($X^2 = 5.352; d.f. = 1; p = .02$) between maternal coaxing to eat and maternal concern about the consumption of too many high sugar foods (Table 55). Mothers concerned about excess sugar consumption were more likely to coax their children to eat (61.3%) than respondents not concerned about sugar intake (39.4%).

In addition, there was a significant relationship ($X^2 = 5.309; d.f. = 1; p = .02$) between maternal coaxing to eat and maternal concern about fussy eating habits (Table 56). A higher proportion of mothers who were concerned about fussy eating habits reported attempting to coax their children to eat (55.2%) than respondents not concerned about fussy eating habits (38.1%). When maternal concern about vegetable intake, milk and meat intake, total amount of food consumed, and maternal rating of appetite were considered, this relationship was no longer significant.

Further, maternal coaxing was not related to maternal rating of willingness to eat, or maternal concern about dawdling, limited consumption of vegetables, meat, milk or amount of food consumed.

Of the 194 respondents, 24.2% stated that they offered their children food as a reward for eating, or deprived food (primarily dessert) if they did not eat. This concurs with the findings of Eppright et al. (1969) who reported that 23% of the mothers of preschool children surveyed used food as a reward and 10% denied favourite foods as a form of

TABLE 54

Maternal Practice Of Coaxing Preschool Children To Eat In Relation To
Lack Of Eating Behaviour Concerns

Coaxes To Eat		Eating Behaviour Concerns		
		Yes	No	TOTAL
Yes	n	74	30	104
	%	48.4	31.9	42.1
No	n	79	64	143
	%	51.6	68.1	57.9
TOTAL	n	153	94	247
	%	100.0	100.0	
% OF TOTAL		61.9	38.1	100.0

$$\chi^2 = 6.465; d.f.=1; p=.01$$

TABLE 55

Maternal Practice Of Coaxing Preschool Children To Eat In Relation To
Concern About Excess Sugar Consumption

Coaxes To Eat		Concern About Sugar		
		Yes	No	TOTAL
Yes	n	19	85	104
	%	61.3	39.4	42.1
No	n	12	131	143
	%	38.7	60.6	57.9
TOTAL	n	31	216	247
	%	100.0	100.0	
% OF TOTAL		12.5	87.5	100.0

$$\chi^2 = 5.352; d.f. = 1; p = .02$$

TABLE 56

Maternal Practice of Coaxing Preschool Children To Eat In Relation To
Concern About Fussy Eating Habits

Coaxes To Eat		Concern-Fussy Eating Habits		
		Yes	No	TOTAL
Yes	n	32	72	104
	%	55.2	38.1	42.1
No	n	26	117	143
	%	44.8	76.5	57.9
TOTAL	n	58	189	247
	%	100.0	100.0	
% OF TOTAL		23.5	76.5	100.0

$$\chi^2 = 5.309; d.f. = 1; p = .02$$

punishment. Metheny et al. (1962a) also reported that 17% of the mothers surveyed restricted or withheld certain pleasures - both food and nonfood - until children finished eating. Twenty-one percent of the mothers of two-year old children surveyed by Owen et al. (1974) also withheld food as a form of punishment.

The use of food as reward/punishment was significantly related ($X^2 = 10.739; d.f. = 2; p = .004$) to the respondents' place of residence (Table 57). Rural (28.1%) and urban (25.0%) residing mothers were more likely to reward or deprive food to encourage eating than city-dwelling mothers (10.7%). When maternal age ($X^2 = 6.45; d.f. = 1; p = .008$), SES ($X^2 = 7.43; d.f. = 1; p = .006$), family size ($X^2 = 9.37; d.f. = 1; p = .002$) education ($X^2 = 9.25; d.f. = 1; p = .002$) employment status ($X^2 = 11.81; d.f. = 1; p = .0006$) and occupation ($X^2 = 6.53; d.f. = 1; p = .01$) were controlled for, the relationship between place of residence and the maternal practice of using food to encourage children to eat was still significant.

Further, there was an interaction between the maternal practice of using food as reward/punishment and the respondents' place of residence and employment status ($X^2 = 8.63; d.f. = 1; p = .01$) (Table 58) (Appendix I). Of metropolitan residing mothers, respondents employed outside the home were less likely to use food as reward/punishment (3:53) than women not employed outside the home (10:55). In contrast, of mothers who lived in non-metropolitan areas, women who were employed outside the home were more likely to use food to encourage eating (18:28) than non-employed respondents (16:64).

The use of food as reward/punishment was significantly related ($X^2 = 8.114; d.f. = 1; p = .004$) to maternal age (Table 59). A higher proportion

TABLE 57

Maternal Use of Food As Reward/Punishment In Relation To Place Of
Residence

Use Of Food	Place Of Residence			TOTAL	
	M ¹	U ²	R ³		
Yes	n	13	11	23	47
	%	10.7	25.0	28.1	19.0
No	n	108	33	59	200
	%	89.3	75.0	71.9	81.0
TOTAL	n	121	44	82	247
	%	100.0	100.0	100.0	
% OF TOTAL		49.9	17.8	33.2	100.0

¹ M=metropolitan

² U=urban

³ R=rural

$\chi^2 = 10.739; d.f. = 2; p = .004$

TABLE 58

Maternal Use Of Food As Reward/Punishment In Relation To Place Of
Residence and Maternal Employment Status

Sample	Residence ¹	Employed ²	Use Of Food		TOTAL
			Yes	No	
1	M	Yes	3	53	56
2	M	No	10	55	65
3	U	Yes	7	17	24
4	U	No	4	16	20
5	R	Yes	11	11	22
6	R	No	12	48	60

¹ M=Metropolitan U+R=Non-metropolitan

$\chi^2 = 8.63; d.f. = 1; p = .01$

of younger mothers (26.2%) reported employing this practice to encourage eating compared to only 12.0% of mothers older than thirty years of age. When SES ($X^2=8.16$;d.f.=1;p=.004), residence ($X^2=5.20$;d.f.=1;p=.02), education ($X^2=5.80$;d.f.=1;p=.01), employment status ($X^2=8.03$;d.f.=1;p=.004), family size ($X^2=10.14$;d.f.=1;p=.001) and occupation status were controlled, the relationship between maternal age and use of food to encourage eating was still significant.

Further, there was a significant interaction between family size, occupational status and maternal use of food to encourage eating ($X^2=8.46$;d.f.=1;p=.003) (Table 60) (Appendix J). Of mothers with higher occupational status, respondents with large families were less likely to use food to encourage eating (8:56) than women with smaller families (19:77). In contrast, of mothers with lower occupational status, women with large families were more likely to use food to encourage children to eat (14:22) than respondents with smaller families (6:44).

Further, the use of food as reward/punishment was significantly related to the gender of the children ($X^2=3.89$;d.f.=1;p=.04) (Table 61). A higher proportion of mothers of female children rewarded or deprived food to encourage eating (23.7%) than mothers of male preschoolers (13.8%).

The practice of using food as reward/punishment was not related to the SES or occupational status of the respondents, contrary to the findings of Owen et al. (1974) who reported that lower income families more frequently employed food rewards than higher income women. Differences between the two studies in determining socioeconomic status may explain this discrepancy.

Further, the practice of rewarding or depriving food was not related to the age of the preschool children, contradicting the research of Owen et al. (1974) who found that parents were more likely to use food

TABLE 59

Maternal Use Of Food As Reward/Punishment In Relation To Maternal Age

Use Of Food	Maternal Age (years)			TOTAL
		20-30	31-43	
Yes	n	32	15	47
	%	26.2	12.0	19.0
No	n	90	110	200
	%	73.8	88.0	81.0
TOTAL	n	122	125	247
	%	100.0	100.0	
% OF TOTAL		49.4	50.6	100.0

$$\chi^2 = 8.114; d.f. = 1; p = .004$$

TABLE 60

Maternal Use Of Food To Encourage Preschool Children To Eat In Relation
To Family Size And Occupational Status

Sample	Occupational Family		Use Of Food		TOTAL
	Status	Size	Yes	No	
1	High	Large	8	56	64
2	High	Small	19	77	96
3	Low	Large	14	22	36
4	Low	Small	6	44	50

¹ Large= 3-6 children Small= 1-2 children

TABLE 61

Maternal Practice of Using Food Rewards To Encourage Preschool Children
To Eat In Relation To Gender

Use Of Food		Gender		TOTAL
		Female	Male	
Yes	n	31	16	47
	%	23.7	13.8	19.0
No	n	100	100	200
	%	76.3	86.2	81.0
TOTAL	n	131	116	247
	%	100.0	100.0	
% OF TOTAL		53.0	47.0	100.0

$\chi^2 = 3.891; d.f. = 1; p = .04$

as reward or punishment with older children, four to six years of age, than with one to two year old children. However, Owen et al. (1974) surveyed a wider age range of children.

The use of food to encourage preschool children to eat was not related to the respondents' educational attainment, employment status, family size, nor the birthrank of the children. In addition, the practice of using food to encourage unwilling children to eat was not significantly related to any of the eating behaviour concerns expressed by the mothers, or to maternal rating of appetite and willingness to eat.

Other practices used less frequently by mothers to encourage children to eat are noted in Table 50.

5.7.2 Maternal Perception Of Practices They Would Employ To Encourage Children To Eat

The fifty-two respondents who stated that their children were "always" willing to eat were asked what they thought they would do if their preschooler became disinterested in food (Table 62). Although the responses are only conjecture on the part of the mothers, they give an indication of maternal attitudes to children's unwillingness to eat at mealtime. The majority of the respondents (63.4%) stated that they did not think they would try to encourage their child to eat, suggesting that parents are aware of appropriate practices to adopt in this situation.

Unwillingness to eat is not uncommon during the preschool years and should not be a cause for parental concern. Unfortunately, preschool

TABLE 62

Maternal Perception Of Practices They Would Employ If Their Children
Were Unwilling To Eat, N=52

Practice	N	% ¹
Ignore/Not push food	33	63.4
Coax/Encourage	7	13.4
Substitute Like Food	7	13.4
Don't know	4	7.6
Food reward	2	3.4
Take food away	1	1.7

¹ totals to more than 100% due to multiple responses

children's unwillingness to eat is often perceived by parents to be inappropriate behaviour and can be the cause of many mealtime confrontations. It is evident that many mothers of preschool children attempt to coax their children to consume what they consider to be the appropriate kind and amount of food, rather than letting the children regulate their own food intake. This may result in mealtime being a frustrating experience for both children and their parents (O'Neil, 1981). The practice of coaxing children to eat was significantly related to the respondents'

place of residence with non-metropolitan residing mothers being more likely to employ this practice. Further, several eating behaviour concerns appear to influence the maternal practice of coaxing children to eat. Mothers concerned about excess sugar intake and fussy eating habits were more likely to report employing this practice than mothers not concerned about these issues. In contrast, mothers who were not concerned about any aspect of their child's eating behaviour were less likely to report verbally coaxing their child to consume more food.

The use of favourite foods as rewards to encourage eating appears to be a prevalent practice. Many of the mothers stated that it was an unwritten rule in their family that the children would not receive dessert if they did not finish their meal. While the practice of using food to encourage preschool children to eat was not related to any of the eating behaviour concerns expressed by the mothers, this practice was significantly related to several demographic variables. Younger mothers and women living in urban and rural areas particularly could benefit from further nutrition education, since using food as reward/punishment may teach children that desserts are desirable while other foods - especially vegetables - are not (Mead, 1945; Ireton and Guthrie, 1972; Birch et al., 1981). Such non-nutritive uses of food with young children have also been associated with teenage obesity, and thus should be discouraged, especially with young girls (Hammar et al., 1972).

The results suggest that the practice of coaxing preschool children to eat is influenced by maternal eating behaviour concerns and appetite rating rather than demographic variables. In contrast, demographic variables were important factors affecting the use of food as reward/punishment. It could be speculated that a different set of dynamics are

influencing the practice of coaxing children to eat and the use of food as reward/punishment.

Nutrition education directed toward helping parents to become aware of the physiological and psychological changes that occur during the preschool years and how these may result in a variable appetite could possibly alleviate parents' overconcern about their preschoolers' food intake and thereby eliminate inappropriate actions. Further, educating parents to have realistic expectations about the amount of food their child can be expected to consume may help decrease the practice of coaxing children to eat, as mothers concerned about the adequacy of their child's diet were more likely to encourage their preschoolers' to eat.

5.8 USE OF FOOD FOR NON-NUTRITIVE PURPOSES

5.8.1 Maternal Practice of Giving Food Treats To Preschool Children

The majority of the mothers surveyed (74.9%) gave their preschool children food as a "treat". The data concur with the findings of Baric et al. (1974) who found that the majority of preschool children surveyed in England (98%) received food as treats, rewards, and tokens of affection.

The majority of mothers surveyed (78.1%) also reported their children received food treats from relatives and friends. Baric et al. (1974) also found that the majority of children surveyed (91%) received favourite foods from grandparents, and 87% from friends and other relatives. While the majority of mothers (52.3%) whose children received food treats from relatives and friends in the current study did not object to this practice, 29.5% of mothers stated that they were concerned

about this practice and tried to limit the amount of sweet foods given to their children (Table 63). An additional 4.1% of the respondents stated that they considered this a problem but did not like to say anything, and nine respondents (4.7%) reported that they were concerned if the food offered was high in sugar. Eighteen of the mothers (9.3%) stated that they did not object to their children receiving food treats as such gifts were not received very frequently.

TABLE 63

Maternal Concern About The Practice of Friends and Relatives Offering
Preschool Children Food Treats

Maternal Attitude	N	%
Concerned - Try To Limit	57	29.5
Don't Like To Say Anything	8	4.1
Don't Mind	101	52.3
Don't Mind If Not Often	18	9.3
Don't Mind If Not Sweets	9	4.7
TOTAL	193	100.0

The use of food as a treat by mothers of preschool children was significantly related ($X^2 = 9.753; d.f. = 2; p = .007$) to the respondents' place of residence, disagreeing with the proposed hypothesis (Table 64). A higher proportion of urban (84.1%) and rural (82.9%) mothers gave their children food treats than metropolitan residing mothers (66.1%). When SES ($X^2 = 11.22; d.f. = 1; p = .0008$), occupation ($X^2 = 13.42; d.f. = 1; p = .0002$), maternal age ($X^2 = 8.74; d.f. = 1; p = .003$), education ($X^2 = 7.68; d.f. = 1; p = .005$), employment status ($X^2 = 9.34; d.f. = 1; p = .002$) and family size ($X^2 = 6.31; d.f. = 1; p = .01$) were controlled, the relationship between place of residence and maternal use of food treats was still significant.

The practice of giving food treats to preschool children was not related to SES, occupational status, maternal education, family size, age, employment status or the age, gender and birthrank of the child, supporting the null hypotheses. However, several maternal eating behaviour concerns were significantly related to the practice of giving food treats to preschool children, contrary to the null hypothesis.

The practice of giving preschool children food treats was also significantly related ($X^2 = 6.558; d.f. = 1; p = .01$) to maternal concern about excess sugar consumption (Table 65). A higher proportion of mothers concerned that their children were eating too many sweets used food as a treat (93.5%) compared to respondents not concerned about sugar consumption (72.2%). As the majority of foods given as treats were high in sugar, the results suggest an inconsistency between maternal concerns and reported feeding practices.

TABLE 64

Use Of Food Treats In Relation To Place Of Residence

Use Of Food Treats		Place Of Residence			TOTAL
		M ¹	U ²	R ³	
Yes	n	80	37	68	185
	%	66.1	84.1	82.9	74.9
No	n	41	7	14	62
	%	33.9	15.9	17.1	25.1
TOTAL	n	121	44	14	247
	%	100.0	100.0	100.0	
% OF TOTAL		49.0	17.8	33.2	100.0

¹ M=Metropolitan

² U=Urban

³ R=Rural

$X^2 = 9.753; d.f. = 2; p = .007$

TABLE 65

Use Of Food Treats In Relation To Maternal Concern About Excess Sugar
Consumption

Use Of Food Treats	Concern About Sweets		TOTAL
	Yes	No	
Yes	n	29	156
	%	93.5	72.2
No	n	2	60
	%	6.5	27.8
TOTAL	n	31	216
	%	100.0	100.0
% OF TOTAL		12.5	87.5

$$\chi^2 = 6.558; d.f. = 1; p = .01$$

The use of food treats was also significantly related to the lack of eating behaviour concerns ($\chi^2 = 5.009; d.f. = 1; p = .02$) (Table 66). Mothers who reported that they were not concerned about any aspect of their children's eating behaviour were less likely to use food treats (67.0%) than mothers who were concerned about eating behaviour (79.7%).

The use of food treats was not related to maternal ratings of appetite and willingness to eat, or to maternal eating behaviour concerns about limited intake of food, meat, milk or vegetables, or dawdling and fussy eating habits. Therefore, the use of food treats does not appear to be related to maternal concerns associated with an inadequate intake of food or to maternal ratings of appetite and willingness to eat.

TABLE 66

Use Of Food Treats In Relation To Lack Of Maternal Eating Behaviour
Concerns

Use Of Food Treats	Eating Behaviour Concerns			TOTAL
		No	Yes	
Yes	n	63	122	185
	%	67.0	79.7	74.9
No	n	31	31	62
	%	33.0	20.3	25.1
TOTAL	n	94	153	247
	%	100.0	100.0	
% OF TOTAL		38.1	61.9	100.0

$$\chi^2 = 5.009; d.f. = 1; p = .02$$

5.8.2 Maternal Reasons For Giving Food Treats To Preschool Children

5.8.2.1 Use Of Food Treats As Rewards

The majority of children (52.9%) who received food as treats received treats as a reward for good behaviour. The results concur with the findings of Baric et al. (1974) who reported that 58% of mothers of preschool children used food as a reward. Eppright et al. (1969) reported a lower percentage of mothers (23%) used favourite food as a reward.

The practice of giving favourite foods to preschool children as rewards for desired behaviour was significantly related to the respondents' place of residence ($X^2=8.178$;d.f.=1;p=.004), disagreeing with the proposed hypothesis (Table 67). Metropolitan mothers were more likely to use food treats as rewards (48.8%) than non-metropolitan respondents (31.0%). When education ($X^2=5.4$;d.f.=1;p=.02), occupational status ($X^2=3.98$;d.f.=1;p=.04), SES ($X^2=4.49$;d.f.=1;p=.03), employment status ($X^2=7.89$;d.f.=1;p=.005), family size ($X^2=10.27$;d.f.=1;p=.001) and maternal age were controlled, this relationship was still significant.

Further, there was an interaction between the use of food treats as rewards, family size, and place of residence ($X^2=5.57$;d.f.=1;p=.01) (Table 68) (Appendix K). Of mothers residing in metropolitan areas, respondents with large families were more likely to use food treats as rewards (24:19) than respondents with small families (35:43). In contrast, a different trend was evident for non-metropolitan mothers. Respondents with small families were more likely to use food treats as rewards (27:42) than respondents with larger families (12:45).

Further, the maternal practice of giving food treats as rewards to preschool children was significantly related ($X^2=7.352$;d.f.=1;p=.006)

TABLE 67

Maternal Use of Food Treats As Rewards In Relation To Place Of Residence

Food Treats- Rewards		Place of Residence		
		Metropolitan	Urban+Rural	TOTAL
Yes	n	59	39	98
	%	48.8	31.0	40.0
No	n	62	87	149
	%	51.2	69.0	60.3
TOTAL	n	121	126	247
	%	100.0	100.0	
% OF TOTAL		49.0	51.0	100.0

$$\chi^2 = 8.178; d.f. = 1; p = .004$$

TABLE 68

Maternal Use Of Food Treats As Rewards In Relation To Place Of Residence
And Family Size

Sample	Place Of Residence ¹²	Family Size ³	Food Rewards		
			Yes	No	TOTAL
1	M	Large	24	19	43
2	M	Small	35	43	78
3	U + R	Large	12	45	57
4	U + R	Small	27	42	69

¹ M=Metropolitan

²U +R=Non-metropolitan

³ Small= 1-2 children Large= 3-6 children

to occupational status of the main wage earner, contrary to the proposed null hypothesis (Table 69). A higher proportion of respondents with higher occupation scores (41.6%) gave their children food treats as rewards compared to respondents with lower occupation scores (24.7%). When maternal age ($X^2 = 8.27; d.f.=1; p=.004$), maternal education ($X^2 = 9.19; d.f.=1; p=.002$), employment status ($X^2 = 7.33; d.f.=1; p=.006$) and family size ($X^2 = 10.27; d.f.=1; p=.001$) were controlled, this relationship was still significant. However, when the place of residence of the respondents' was controlled, this relationship was no longer significant. Therefore, the main variable affecting maternal use of food treats as rewards appears to be the respondents' place of residence.

The use of food treats as rewards was also significantly related ($X^2 = 5.789; d.f.=1; p=.01$) to the age of the preschool children, contrary to the formulated hypothesis (Table 70). A higher proportion of older preschool children received food treats as rewards (44.2%) than younger children (27.3%). The results concur with the findings of Owen et al. (1974) who also found that parents were more likely to use food rewards with older preschool children. It could be speculated that mothers of younger children do not believe that food rewards would be effective with children only two years of age.

The practice of rewarding preschool children with food treats was not related to the respondents' SES, contrary to the findings of Owen et al. (1974) who reported that women from lower SES groups were more likely to use food rewards than more privileged mothers. However, differences between studies in assessing SES (Green's index in current study versus Warner Rank) may explain this discrepancy.

TABLE 69

Maternal Use Of Food Treats As Rewards In Relation To Occupational
Status

Food Treats- Rewards		Occupational Status		
		Low	Higher	TOTAL
Yes	n	24	62	86
	%	24.7	41.6	35.0
No	n	73	87	160
	%	75.3	58.4	65.0
TOTAL	n	97	149	246 ¹
	%	100.0	100.0	
% OF TOTAL		39.4	60.6	100.0

¹excludes one case for which a value was not available

$\chi^2 = 7.352; d.f. = 1; p = .006$

TABLE 70

Maternal Use Of Food Treats As Rewards In Relation To The Age Of
Preschool Children

Food Treats- Rewards		Age (years)		
		2	3-4	TOTAL
Yes	n	18	80	98
	%	27.3	44.2	40.0
No	n	48	101	149
	%	72.7	55.8	60.3
TOTAL	n	66	181	247
	%	100.0	100.0	
% OF TOTAL		26.7	73.3	100.0

$$X^2 = 5.789; d.f. = 1; p = .01$$

The use of food treats as rewards was also not related to the respondents' education, employment status, maternal age, and family size, or the age, gender and birthrank of the child, agreeing with the proposed hypothesis.

As it was hypothesized that appropriate dietary practices would not be related to ratings of appetite and willingness to eat, or to maternal eating behaviour concerns, the relationship of these variables to maternal use of food treats was investigated. Maternal practice of using food treats as rewards was significantly related ($X^2 = 6.653; d.f. = 1; p = .009$) to maternal rating of preschool children's willingness to eat (Table 71). A higher proportion of mothers who considered their children willing to eat only "some of the time" or "rarely" used food treats as rewards (57.1%) compared to mothers who perceived their children to be willing to eat "always" or "most of the time" (35.8%). This relationship was still significant when considered in the presence of maternal rating of appetite, a variable significantly related to willingness rating ($X^2 = 7.10; d.f. = 1; p = .007$).

In addition, the use of food treats as rewards was significantly related ($X^2 = 3.819; d.f. = 1; p = .05$) to the lack of maternal eating behaviour concerns (Table 72). Respondents who reported that they were not concerned about any aspect of their children's eating behaviour were less likely to use food treats as rewards (31.9%) than mothers who did mention eating behaviour concerns (44.4%).

Further, the maternal practice of using food treats as rewards for good behaviour was significantly related to maternal concern about limited vegetable consumption ($X^2 = 3.832; d.f. = 1; p = .05$) (Table 73). Mothers who

TABLE 71

Maternal Use Of Food Treats As Rewards In Relation To Maternal Rating Of
Willingness To Eat

Food Treats- Rewards	Willingness Rating			TOTAL
		Most Times ¹	Sometimes ²	
Yes	n	73	24	97
	%	35.8	57.1	39.4
No	n	131	18	149
	%	64.2	42.9	60.6
TOTAL	n	42	204	246 ³
	%	100.0	100.0	
% OF TOTAL		17.1	82.9	100.0

¹ Most Times="Always + Most Of Time"

² Sometimes ="Sometimes + Rarely"

³ Excludes one case for which a value was not available

$\chi^2 = 6.653; d.f. = 1; p = .009$

TABLE 72

Maternal Use Of Food Treats As Rewards In Relation To Lack Of Eating
Behaviour Concerns

Food Treats- Rewards		Eating Behaviour Concerns		
		No	Yes	TOTAL
Yes	n	30	68	98
	%	31.9	44.4	39.7
No	n	64	85	149
	%	68.1	55.6	60.3
TOTAL	n	94	153	247
	%	100.0	100.0	
% OF TOTAL		38.1	61.9	100.0

$$\chi^2 = 3.819; d.f. = 1; p = .05$$

were concerned that their children were not eating enough vegetables were more likely to use food treats as rewards (52.1%) than respondents not concerned about vegetable consumption (36.7%). This relationship was still significant when examined in the presence of appetite rating ($X^2 = 4.55; d.f. = 1; p = .04$), and maternal concern about fussy eating habits ($X^2 = 3.95; d.f. = 1; p = .04$), total amount of food consumed ($X^2 = 4.96; d.f. = 1; p = .04$), meat intake ($X^2 = 3.65; d.f. = 1; p = .05$) and milk intake ($X^2 = 4.07; d.f. = 1; p = .04$).

The use of food treats as rewards was also significantly related ($X^2 = 9.391; d.f. = 1; p = .002$) to maternal concern about fussy eating habits (Table 74). A higher proportion of respondents concerned about fussy eating habits used food treats as rewards (56.9%) than mothers not concerned about fussy eating habits (34.4%). This relationship was still significant when examined in the presence of maternal rating of appetite ($X^2 = 10.39; d.f. = 1; p = .001$), willingness to eat ($X^2 = 4.65; d.f. = 1; p = .03$), limited vegetable intake ($X^2 = 5.08; d.f. = 1; p = .04$), total amount of food consumed ($X^2 = 4.29; d.f. = 1; p = .03$), meat intake ($X^2 = 3.05; d.f. = 1; p = .04$), and milk intake ($X^2 = 3.68; d.f. = 1; p = .05$).

The use of food treats as rewards was not significantly related to maternal rating of appetite, maternal concern about dawdling, the consumption of too little food, meat, milk, or the consumption of too many high-sugar foods. Although hypotheses had not been formulated, the relationship between the use of food treats as rewards and the maternal practice of using food as reward/punishment for unwillingness to eat was examined to assess whether parents are consistent in their use of food. The maternal use of food treats as rewards was not related to the use of food to encourage eating. However, this finding may not be unexpected

TABLE 73

Maternal Use Of Food Treats As Rewards In Relation To Maternal Concern
About Limited Vegetable Consumption

Food Treats- Rewards		Concern About Vegetables		TOTAL
		Yes	No	
Yes	n	25	73	98
	%	52.1	36.7	40.0
No	n	23	126	149
	%	47.9	63.3	60.3
TOTAL	n	48	199	247
	%	100.0	100.0	
% OF TOTAL		19.4	80.6	100.0

$$X^2 = 3.832; d.f. = 1; p = .05$$

TABLE 74

Maternal Use Of Food Treats As Rewards In Relation To Maternal Concern
About Fussy Eating Habits

Food Treats- Rewards		Concern: Fussy Eating Habits		
		Yes	No	TOTAL
Yes	n	33	65	98
	%	56.9	34.4	39.7
No	n	25	124	149
	%	43.1	65.6	60.3
TOTAL	n	58	189	247
	%	100.0	100.0	
% OF TOTAL		23.5	76.5	100.0

$$\chi^2 = 9.391; d.f. = 1; p = .002$$

as food is being used for very different purposes in each case (to reward good behaviour versus to encourage eating).

5.8.2.2 Use Of Food Treats As Pacifiers

Seventy-three of the 185 mothers who reported giving their children food as "treats" (39.4%) stated that they used food treats as pacifiers. Both Eppright et al. (1969) and Baric et al. (1974) reported similar findings.

The use of food treats as pacifiers was significantly related to the respondents' place of residence ($X^2 = 30.387; d.f. = 1; p = .0001$), contrary to the proposed null hypothesis (Table 75). A higher proportion of non-metropolitan mothers (45.2%) used food treats as pacifiers than metropolitan mothers (13.2%). The relationship between the use of food treats as pacifiers and place of residence was still significant when examined in the presence of SES ($X^2 = 19.49; d.f. = 1; p = .0001$), maternal age ($X^2 = 26.64; d.f. = 1; p = .0001$), family size ($X^2 = 25.85; d.f. = 1; p = .0001$), maternal education ($X^2 = 28.37; d.f. = 1; p = .0001$), employment status ($X^2 = 26.85; d.f. = 1; p = .0001$), and occupational status ($X^2 = 18.47; d.f. = 1; p = .0001$).

The use of food treats as a pacifier was not related to SES, occupation, maternal education, maternal age, employment status, and family size, or the age, gender and birthrank of the child, supporting the formulated hypotheses.

In addition, the use of favourite foods as a pacifier was significantly related ($X^2 = 5.748; d.f. = 1; p = .01$) to maternal rating of willingness to eat (Table 76). A higher proportion of mothers who considered

TABLE 75

Maternal Use Of Food Treats As Pacifiers In Relation To Place Of
Residence

Food Treats- Pacifiers		Place of Residence		
		Metropolitan	Urban+Rural	TOTAL
Yes	n	16	57	73
	%	13.2	45.2	29.6
No	n	105	69	174
	%	86.8	54.7	70.4
TOTAL	n	121	126	247
	%	100.0	100.0	
% OF TOTAL		49.0	51.0	100.0

$$X^2 = 30.387; d.f. = ; p = .0001$$

their children willing to eat "always" or "most of the time" used food as a pacifier (32.8%) compared to respondents who rated their children willing to eat only "some of the time" or "rarely" (14.3%). This relationship was still significant ($X^2 = 5.24; d.f. = 1; p = .02$) when examined in the presence of maternal rating of appetite. Perhaps mothers who perceive their children as generally willing to eat are more likely to feel that food can be used as an effective pacifier than mothers who considered their children as being generally unwilling to eat.

The use of food treats as a pacifier was also significantly related to maternal concern about excess sugar consumption ($X^2 = 17.148; d.f. = 1; p = .0001$) (Table 77). A higher proportion of respondents who were concerned that their children were consuming too many sweets used food treats as pacifiers (61.3%) than mothers not worried about sugar intake (25.0%).

Further, the practice of giving preschool children food treats as pacifiers was significantly related to the use of food treats as rewards for good behaviour ($X^2 = 13.654; d.f. = 1; p = .0002$) (Table 78). Mothers who used food treats as rewards were less likely to use food treats as pacifiers (16.3%) than respondents who did not use favourite foods as rewards (38.3%).

The use of food treats as pacifiers was also significantly related ($X^2 = 4.711; d.f. = 1; p = .03$) to the maternal practice of using food as reward/punishment (Table 79). Mothers who used food as reward/punishment were more likely to use food treats as pacifiers (42.5%) than mothers who did not reward or deprive food if their children were unwilling to eat (26.5%).

TABLE 76

Maternal Use Of Food Treats As Pacifiers In Relation To Maternal Rating
Of Willingness To Eat

Food Treats- Pacifier		Willingness Rating		TOTAL
		Most Times ¹	Sometimes ²	
Yes	n	67	6	73
	%	32.8	14.3	30.0
No	n	137	36	173
	%	67.2	85.7	70.3
TOTAL	n	204	42	246 ³
	%	100.0	100.0	
% OF TOTAL		82.9	17.1	100.0

¹ always+most times

² sometimes+rarely

³ excludes one case for which a value was not available

mantened =5.748;d.f.=1;p=.01

TABLE 77

Maternal Use Of Food Treats As Pacifiers In Relation To Maternal Concern
About Excess Sugar Consumption

Food Treats- Pacifiers		Concern: Sugar Intake		
		Yes	No	TOTAL
Yes	n	19	54	73
	%	61.3	25.0	29.5
No	n	12	162	174
	%	38.7	75.0	70.5
TOTAL	n	31	216	247
	%	100.0	100.0	
% OF TOTAL		12.5	87.5	100.0

$$\chi^2 = 17.148; d.f. = 1; p = .0001$$

TABLE 78

Maternal Use Of Food Treats As Pacifiers In Relation To Use Of Food
Treats As Rewards

Food Treats- Pacifiers		Food Treats As Rewards		
		Yes	No	TOTAL
Yes	n	16	57	73
	%	16.3	38.3	29.5
No	n	82	92	174
	%	83.7	61.4	70.5
TOTAL	n	98	149	247
	%	100.0	100.0	
% OF TOTAL		39.7	60.3	100.0

$$\chi^2 = 13.654; d.f. = 1; p = .0002$$

TABLE 79

Maternal Use Of Food Treats As Pacifiers In Relation To Maternal
Practice Of Using Food As Reward/Punishment

Food Treats- Pacifiers	Food To Encourage Eating		TOTAL	
	Yes	No		
Yes	n	20	53	73
	%	42.5	26.5	29.5
No	n	27	147	174
	%	57.5	73.5	70.5
TOTAL	n	47	200	247
	%	100.0	100.0	
% OF TOTAL		19.0	81.0	100.0

$$\chi^2 = 4.711; d.f. = 1; p = .03$$

The use of food as a pacifier was not related to maternal rating of appetite or maternal concern about vegetable, meat, milk, and total food intake, or dawdling and fussy eating habits.

5.8.2.3 Use Of Food Treats On Special Occasions

Forty-seven of the mothers stated that their children received food treats on special occasions such as birthdays, Christmas and Easter - representing 19.0% of the sample who gave their preschoolers food treats. Baric et al. (1974) noted that a higher proportion of preschool children received presents of favourite foods on special occasions. However, in the present study, it is possible that the percentage of parents who presented their children with food treats on special occasions was underestimated. The practice of consuming sweet foods on such occasions is so pervasive in the North American culture that many mothers may not have considered food given on such times as "treats".

The practice of using food treats on special occasions was significantly related to the respondents' place of residence ($X^2 = 42.162; d.f. = 1; p = .0001$), agreeing with the proposed hypothesis (Table 80). A higher proportion of non-metropolitan mothers (34.9%) gave their children food treats on such occasions compared to metropolitan respondents (2.5%). This relationship was still significant when examined in the presence of occupational status ($X^2 = 14.35; d.f. = 1; p = .0002$), maternal age ($X^2 = 22.67; d.f. = 1; p = .0001$), employment status ($X^2 = 22.89; d.f. = 1; p = .0001$), maternal education ($X^2 = 17.11; d.f. = 1; p = .0001$), family size ($X^2 = 22.5-; d.f. = 1; p = .0001$) and SES ($X^2 = 14.81; d.f. = 1; p = .0001$).

TABLE 80

Maternal Practice Of Using Food Treats On Special Occasions In Relation
To Place Of Residence

Food Treats: Special Occasions		Place Of Residence		TOTAL
		M ¹	U + R ²	
Yes	n	8	44	47
	%	2.5	34.9	19.0
No	n	118	82	200
	%	97.5	65.1	81.0
TOTAL	n	121	126	247
	%	100.0	100.0	
% OF TOTAL		49.0	51.0	100.0

¹ Metropolitan

² Non-metropolitan

$\chi^2 = 42.162; d.f. = 1; p = .0001$

Further, the practice of giving food treats on special occasions was significantly related ($X^2 = 6.627; d.f.=1; p=.01$) to occupational status (Table 81). A higher proportion of respondents with lower occupation scores (27.6%) gave their children food treats on special occasions compared to respondents with higher occupational status (14.4%). When employment status ($X^2 = 5.52; d.f.=1; p=.01$), family size ($X^2 = 6.74; d.f.=1; p=.009$), maternal age ($X^2 = 6.29; d.f.=1; p=.01$) and maternal education ($X^2 = 7.53; d.f.=1; p=.006$) were controlled for, this relationship was still significant. However, when the use of food treats on special occasions was examined in relation to occupational status, controlling respondents' place of residence, this relationship was no longer significant. Therefore, the mothers' area of residence appears to be a stronger predictor of maternal use of food treats on special occasions.

The maternal practice of using food treats on special occasions was also significantly related to the gender of the preschool children ($X^2 = 3.891; d.f.=1; p=.04$), contrary to the formulated hypothesis (Table 82). A higher proportion of female children received favourite foods on special occasions (23.7%) than male children (13.8%).

The maternal practice of giving favourite foods as treats on special occasions was not significantly related to SES, maternal education, family size, maternal age, and employment status, nor to the age and birthrank of the child, supporting the proposed null hypothesis.

Further, the use of food treats on special occasions was significantly related to several eating behaviour concerns, contrary to the

TABLE 81

Maternal Practice of Giving Preschool Children Food Treats On Special Occasions In Relation To Occupational Status

Food Treats: Special Occasions		Occupational Status		
		High	Low	TOTAL
Yes	n	23	24	46
	%	14.4	27.6	19.1
No	n	137	62	200
	%	85.6	72.4	81.9
TOTAL	n	160	86	246 ¹
	%	100.0	100.0	
% OF TOTAL		65.0	35.0	100.0

¹ excludes one case for which a value was not available

$\chi^2 = 6.627; d.f. = 1; p = .01$

TABLE 82

Maternal Practice Of Giving Food Treats To Preschool Children On Special
Occasions In Relation To Gender

Food Treats: Special Occasions		Gender		
		Female	Male	TOTAL
Yes	n	31	16	47
	%	23.7	13.8	19.0
No	n	100	100	200
	%	76.3	86.2	81.0
TOTAL	n	131	116	247
	%	100.0	100.0	
% OF TOTAL		53.0	47.0	100.0

$$\chi^2 = 3.891; d.f. = 1; p = .04$$

proposed hypothesis. Maternal practice of using food treats on special occasions was significantly related ($X^2 = 8.912; d.f. = 1; p = .002$) to maternal concern about excess sugar consumption (Table 83). Mothers who were concerned that their children were consuming too many sweets were more likely to give their preschoolers food treats on special occasions (38.7%) than mothers not concerned about sugar intake (16.2%). Once again, an inconsistency between maternal concern and reported feeding practices was evident.

Further, the maternal practice of presenting gifts of favourite foods to preschool children on special occasions was significantly related ($X^2 = 3.548; d.f. = 1; p = .05$) to maternal concern about meat consumption (Table 84). Mothers concerned about their children's meat intake were less likely to use food treats on special occasions (4.4%) than respondents worried about meat consumption (20.5%). As maternal concern about meat intake was significantly related to maternal rating of appetite, fussy eating habits, limited vegetable intake, and the total amount of food consumed, these variables were controlled, causing the relationship to no longer be significant.

Maternal practice of giving preschool children food treats on special occasions was also significantly related to maternal concern about milk intake ($X^2 = 5.812; d.f. = 1; p = .01$) (Table 85). A higher proportion of mothers concerned about milk intake gave their children food treats on special occasions (41.2%) compared to women not worried about milk consumption (17.4%). This relationship was still significant when examined in the presence of maternal rating of appetite ($X^2 = 6.05; d.f. = 1; p = .01$), fussy eating habits ($X^2 = 5.85; d.f. = 1; p = .02$), and limited vegetable intake ($X^2 = 6.47; d.f. = 1; p = .01$).

TABLE 83

Maternal Practice Of Using Food Treats On Special Occasions In Relation
To Maternal Concern About Excess Sugar Consumption

Food Treats:		Concern: Sugar Consumption		
Special Occasions		Yes	No	TOTAL
Yes	n	12	35	47
	%	38.7	16.2	19.0
No	n	19	181	200
	%	61.3	83.8	81.0
TOTAL	n	31	216	247
	%	100.0	100.0	
% OF TOTAL		12.5	87.5	100.0

$$\chi^2 = 8.912; d.f. = 1; p = .002$$

TABLE 84

Maternal Practice Of Giving Preschool Children Food Treats On Special Occasions In Relation To Maternal Concern About Meat Intake

Food Treats:		Concern:Meat Intake		
Special Occasions		No	Yes ¹	TOTAL
Yes	n	46	1	47
	%	20.5	4.4	19.0
No	n	178	22	200
	%	79.5	95.7	81.0
TOTAL	n	224	23	247
	%	100.0	100.0	
% OF TOTAL		90.7	9.3	100.0

¹ includes 3 respondents concerned about excess meat intake
 $\chi^2 = 3.548; d.f. = 1; p = .05$

TABLE 85

Maternal Practice Of Giving Food Treats To Preschool Children On Special Occasions In Relation To Maternal Concern About Milk Intake

Food Treats: Special Occasions		Concern:Milk Intake		
		Yes ¹	No	TOTAL
Yes	n	7	40	47
	%	41.2	17.4	19.0
No	n	10	190	200
	%	58.8	82.6	81.0
TOTAL	n	17	230	247
	%	100.0	100.0	
% OF TOTAL		6.9	93.2	100.0

¹ includes 2 subjects concerned about excess milk intake
 $\chi^2 = 5.812; d.f. = 1; p = .01$

Further, the use of food treats on special occasions was not related to maternal ratings of appetite and willingness to eat, or to maternal concern about the amount of food consumed, limited vegetable intake, dawdling, or fussy eating habits.

5.8.3 Food Given Most Frequently As A Treat To Preschool Children

The type of food treats most frequently given to preschool children were candies, chocolates, and gum (42.7%); fruits and vegetables (24.9%); and baked goods and desserts (13.0%) (Table 86). The results do not concur with the findings of Eppright et al. (1969) who found that the foods most frequently offered as rewards to preschool children were baked goods and desserts (75%) followed by sweets and candies (39%) and fruits (32%). It is encouraging to note that in the present study fruits and vegetables were the second most frequently offered food treats, ahead of baked goods and desserts.

The foods given most frequently as treats to preschool children were classified into four groups based on nutritional and dental acceptability (Table 87). Only 31.9% of the foods offered most frequently as treats could be classified as nutritionally and dentally acceptable. The majority (68.1%) of the food treats were high in sugar, fat, or salt.

In addition, the four groups of foods given most often as treats were divided into "nutritious" (Group 1 + 2) and "non-nutritious" (Group 3 + 4) foods, disregarding dental acceptability. The type of food treat most frequently given to preschool children was significantly related to the age of the child, contrary to the proposed hypothesis (χ^2

TABLE 86

Food Offered Most Frequently As Treats To Preschool Children

Food Treat	N	%
Candies/Chocolate/Gum	79	42.7
Fruits/Vegetables	46	24.9
Baked Goods/Desserts	24	13.0
French Fries/Potato Chips	11	5.9
Dairy Products	8	4.3
Ice Cream/Raisins	8	4.3
Meat/Sandwiches	4	2.2
Sugarless Gum	4	2.2
Breads/Cereals	1	0.5
TOTAL	185	100.0

TABLE 87

Nutritional And Dental Classification Of Food Treats Given Most
Frequently To Preschool Children

Classification	N	%
1. Nutritionally And Dentally Acceptable	59	31.9
2. Nutritionally Acceptable But Dentally Non-Acceptable	8	4.3
3. Nutritionally Non-Acceptable But Dentally Acceptable	15	8.1
4. Nutritionally And Dentally Non-Acceptable	103	55.7
TOTAL	185	100.0

=7.945;d.f.=1;p=.004) (Table 88). A higher proportion of young children received non-nutritious treats (80.9%) than older preschoolers, three and four years of age (42.0%).

Contrary to the null hypothesis, the use of non-nutritious food treats was positively related to the respondents' place of residence ($X^2 = 6.202$;d.f.=2;p=.04) (Table 89). Metropolitan residing mothers were less likely to give their children non-nutritious treats (53.7%) than urban (73.0%) and rural (70.6%) respondents. This relationship was no longer significant when examined in the presence of SES, occupational status, family size, employment status, maternal age, and education.

The results supported the hypothesis that the type of food treat offered most frequently to preschool children would not be significantly related to SES, occupational status, maternal education, maternal age, employment status, family size, or the birthrank, age, and gender of the child.

Contrary to the proposed null hypothesis that appropriate dietary practices implemented by mothers would not be related to eating behaviour concerns, the type of food treat given most frequently to preschool children was significantly related to maternal concern about dawdling ($X^2 = 5.840$;d.f.=1;p=.01) (Table 90). Mothers who were concerned about meal-time dawdling were more likely to offer nutritious food treats to their children (58.3%) than respondents not concerned about dawdling (32.9%). This relationship was still significant when examined in the presence of maternal rating of appetite ($X^2 = 3.96$;d.f.=1;p=.04) and willingness to eat ($X^2 = 3.65$;d.f.=1;p=.05), which was significantly related to maternal concern about dawdling.

TABLE 88

Type Of Food Given Most Frequently As A Treat In Relation To The Age Of
Preschool Children

Type Of Treat	Age (years)			TOTAL
		2	3-4	
Nutritious	n	9	58	67
	%	19.1	42.0	36.2
Non-Nutritious	n	38	80	118
	%	80.9	58.0	63.8
TOTAL	n	47	138	185
	%	100.0	100.0	
% OF TOTAL		25.4	74.6	100.0

$$\chi^2 = 7.945; d.f. = 1; p = .004$$

TABLE 89

Type Of Food Given Most Frequently As A Treat To Preschool Children In
Relation To Place Of Residence

Type Of Food Treat	Place Of Residence			TOTAL	
	M ¹	U ²	R ³		
Nutritious	n	37	10	20	67
	%	46.2	27.0	29.4	36.2
Non-Nutritious	n	43	27	48	118
	%	53.7	73.0	70.6	63.8
TOTAL	n	80	37	68	185
	%	100.0	100.0	100.0	
% OF TOTAL		43.2	20.0	36.8	100.0

¹ M=Metropolitan

² U=Urban

³ R=Rural

$\chi^2 = 6.202; d.f. = 2; p = .04$

TABLE 90

Type Of Food Treat Given Most Frequently To Preschool Children In
Relation To Maternal Concern About Dawdling

Type Of Food Treat	Concerned About Dawdling			
		Yes	No	TOTAL
Nutritious	n	14	53	67
	%	58.3	32.9	36.2
Non-Nutritious	n	10	108	118
	%	41.7	67.1	63.8
TOTAL	n	24	161	185
	%	100.0	100.0	
% OF TOTAL		13.0	87.0	100.0

$$X^2 = 5.840; d.f. = 1; p = .01$$

The type of food treat offered most frequently to preschool children was also significantly related ($X^2 = 3.589; d.f. = 1; p = .05$) to maternal concern about excess sugar consumption (Table 91). Respondents concerned that their children were consuming too many sweets were more likely to offer their children non-nutritious food treats (79.3%) than mothers not concerned about sugar intake (60.9%).

The type of food treat offered most frequently was not significantly related to maternal concern about limited vegetable, meat, and milk intake, total food consumed, to fussy eating habits or to maternal ratings of appetite and willingness to eat.

In summary, it is evident that a significant number of mothers of preschool children use favourite foods as rewards, pacifiers, and on special occasions, despite the recommendations of nutritionists that such practices should not be employed with children. Mothers residing in non-metropolitan areas were more likely to use food as a treat, especially as pacifiers and on special occasions. Mothers living in metropolitan areas were more likely to use food treats as rewards. Mothers were also more likely to use food treats as rewards with older preschoolers, and female children were more likely to receive treats on special occasions. Therefore, not only demographic characteristics but also characteristics associated with the child appear to be influencing this practice.

Mothers who were not concerned about any aspect of their children's eating behaviours were less likely to use food as a treat, especially as a reward. In contrast, mothers who were concerned about excess sugar intake were more likely to use food treats, particularly as pacifiers

TABLE 91

Type Of Food Treat Given Most Frequently To Preschool Children In
Relation To Maternal Concern About Excess Sugar Consumption

Type Of Food Treat	Concern: Sugar Intake			
		Yes	No	TOTAL
Nutritious	n	6	61	67
	%	20.7	39.1	36.2
Non-Nutritious	n	23	95	118
	%	79.3	60.9	63.8
TOTAL	n	29	156	185
	%	100.0	100.0	
% OF TOTAL		15.7	84.3	100.0

$$\chi^2 = 3.589; d.f. = 1; p = .05$$

and on special occasions. Further, mothers concerned about limited vegetable intake tended to use food treats as rewards, and mothers concerned about milk intake tended to use food treats on special occasions. The results suggest that alleviating parental concern about their child's eating behaviour may help to decrease non-nutritive uses of food with preschool children. However, nutrition educators must also address the demographic and child influences on these practices.

As the majority of food treats offered to children most frequently were nutritionally and dentally unacceptable, nutrition educators should focus on parental use of food treats as several studies have shown that foods offered in such non-nutritive ways by mothers may teach children that foods high in sugar, fat, and salt are desirable (Birch, 1980; Birch, 1981; Birch et al., 1981; Ireton and Guthrie, 1972). As children are forming their food habits and their attitudes toward foods during the preschool years, it has been suggested that emotional associations with food formed during these early years may last a lifetime (Pipes, 1981; Beyer and Morris, 1974). Educating parents of young children about the possible long-range effects of such practices may also help to decrease non-nutritive uses of food.

5.9 BETWEEN-MEAL EATING BEHAVIOUR OF PRESCHOOL CHILDREN

Almost all of the mothers surveyed reported giving their preschool children between-meal snacks (96.8%), confirming the findings of the Nutrition Canada Survey (Health Protection Branch, 1977a) and the study by Beals et al. (1981) in which it was reported that snacking has become a way of life for Canadian children. Eppright et al. (1969) also

noted that mealtimes were not well-defined for most preschool children, but rather extended evenly throughout the day. The research stresses the importance of between-meal snacks in providing energy and nutrients in the diets of preschool children (Eppright et al., 1972; Health Protection Branch, 1977a). Only a few respondents stated that they did not allow their children to consume any food between meals.

5.9.1 Food Offered Most Frequently To Preschool Children As Between-Meal Snacks

The popularity of fruit and vegetables, breads and cereals, baked goods, milk and cheese can be seen in the foods offered most frequently as snacks to preschool children (Table 92). Similar results have been reported by other researchers who have investigated the between-meal eating habits of preschool children (Dierks and Morse, 1965; Lamkin et al., 1970; Pao, 1980; Beals et al., 1981; Beyer and Morris, 1974). The most frequently consumed snacks were very similar to those listed by Dierks and Morse (1965) for preschool children in Minnesota.

The foods offered most frequently to preschool children as between-meal snacks were classified as nutritionally and dentally acceptable (Table 93). The majority of the children were receiving snacks both high in nutrients and low in sugar, fat and salt. However, a small but important group of children (12.9%) usually received snacks not considered appropriate by nutritionists and dentists.

For statistical analysis, the type of foods offered most frequently to preschool children as between-meal snacks were combined into two groups representing "nutritious" (Group 1 + 2) and "non-nutritious" (Group 3 + 4) snacks, disregarding dental acceptability. Contrary to

TABLE 92

Food Given Most Frequently To Preschool Children As Between-Meal Snacks

Snack Food	N	%
Fruit/Vegetables	143	59.8
Cereals/Bread	35	14.6
Baked Goods/Desserts	28	11.7
Dairy Products	28	11.7
Meat/Sandwiches	2	0.8
Ice Cream/Dried Fruit	2	0.8
Candy/Chocolate/Gum	1	0.4
TOTAL	239	100.0

the proposed null hypothesis, the type of snack offered most frequently to preschool children was significantly related to family size. Family size was significantly related to the practice of serving nutritious snacks ($X^2 = 4.827$; d.f. = 1; $p = .02$) (Table 94). Respondents with small families were more likely to offer their children non-nutritious snacks (15.5%) than mothers with three to six children (6.2%). This relationship was still significant when examined in the presence of SES ($X^2 = 4.49$; d.f. = 1; $p = .03$), place of residence ($X^2 = 4.13$; d.f. = 1; $p = .04$), education ($X^2 = 3.91$; d.f. = 1; $p = .04$), maternal age ($X^2 = 4.12$; d.f. = 1; $p = .04$), and occupational status ($X^2 = 4.48$; d.f. = 1; $p = .03$).

TABLE 93

Nutritional And Dental Acceptability Of Between-Meal Snacks Consumed
Most Frequently By Preschool Children

Classification	N	%
1. Nutritionally And Dentally Acceptable	208	86.9
2. Nutritionally Acceptable But Dentally Non-Acceptable	2	0.8
3. Nutritionally Non-Acceptable But Dentally Acceptable	-	-
4. Nutritionally And Dentally Non-Acceptable	29	12.1
TOTAL	239	100.0

TABLE 94

Type Of Food Given Most Frequently As A Snack To Preschool Children In
Relation To Family Size

Type Of Snack Food	Number Of Children			
		1-2	3-6	TOTAL
Nutritious	n	120	91	211
	%	84.5	93.8	88.3
Non-Nutritious	n	22	6	28
	%	15.5	6.2	11.7
TOTAL	n	142	97	239
	%	100.0	100.0	
% OF TOTAL		59.4	40.6	100.0

$$\chi^2 = 4.827; d.f. = 1; p = .02$$

There was no relationship between the type of snack food offered and place of residence, maternal age, employment status, occupational status, and maternal education, or the age and gender of the child, in agreement with the proposed hypothesis.

The type of snack food offered most frequently to preschool children was not significantly related to SES, contrary to the findings of several researchers who have studied the between-meal eating habits of preschool children. The previous studies found that children from higher SES families tended to consume more fruits and fruit juices as well as lower intakes of sweets and candies (Crawford et al., 1978; Martinez, 1982; Owen et al., 1974; Myres and Kroetsch, 1978; Samuelson et al., 1971). However, recently Martinez (1982), who studies the snacking habits of French-Canadian children, five to six years of age, noted that children from higher SES families tended to consume more candy and carbonated beverages.

Contrary to the formulated null hypothesis, the type of food offered most frequently as betweenmeal snacks to preschool children was significantly related ($X^2=9.467$;d.f.=1;p=.002) to maternal concern about meat consumption (Table 95). A higher proportion of mothers concerned about meat intake (31.8%) offered their children non-nutritious snack foods compared to respondents who were not concerned about meat intake (9.7%). This relationship was still significant when examined in the presence of maternal rating of appetite ($X^2=7.29$;d.f.=1;p=.007), and maternal concern about fussy eating habits ($X^2=7.65$;d.f.=1;p=.005), limited vegetable intake ($X^2=7.60$;d.f.=1;p=.005), and the amount of food consumed ($X^2=4.41$;d.f.=1;p=.03).

The type of food offered most frequently as a between-meal snack was not significantly related to maternal ratings of appetite or willingness to eat, or to maternal concern about fussy eating habits, daw-

TABLE 95

Type Of Snack Given Most Frequently To Preschool Children In Relation To
Maternal Concern About Meat Consumption

Type Of Snack Food	Concern:Meat Intake			
		Yes	No	TOTAL
Nutritious	n	15	196	211
	%	68.2	90.3	88.3
Non-Nutritious	n	7	21	29
	%	31.8	9.7	11.7
TOTAL	n	22	217	239
	%	100.0	100.0	
% OF TOTAL		9.2	90.8	100.0

$$\chi^2 = 9.467; d.f. = 1; p = .002$$

dling, milk intake, limited consumption of vegetable, total amount of food, or excess intake of high-sugar foods.

While it is encouraging to note that in the present study the majority of mothers surveyed were usually offering their children nutritious snacks, it is probable that many children were receiving high-sugar foods as between-meal snacks, at least on an occasional basis, as the methods used in determining snack-food consumption may not have "tapped" all of the snack foods consumed by the children, as actual food consumption data were not collected. Several studies which have examined the dietary records of preschool children have found that a significant proportion of the snacks consumed were high in sugar. Weiss and Trithart (1960) reported that the favourite snack food of 80% of the 783 preschool children surveyed could be classified as a confection. Beyer and Morris (1965) also noted that 21.2% of the snacks consumed by the young children surveyed were classified as sweets. A recent survey of four to five year old children by the United States Department Of Agriculture found that the most frequently consumed snack foods were primarily high-sugar foods such as baked goods (mostly cookies), soft drinks, milk desserts, and candy (Pao, 1980). Such between-meal eating habits may have significant nutritional implications as clear evidence exists suggesting an association with between-meal sugar consumption and dental caries. Weiss and Trithart (1960) found that as the frequency of eating sweet foods increased, the number of decayed, filled or missing primary teeth in the preschool children surveyed also increased. Similar results were reported by Samuelson et al. (1971) who studied the food consumption patterns of 188 four year old children in Sweden. The re-

searchers reported that the children's total consumption of sweets was positively related to the number of decayed, extracted and filled primary teeth and plaque indices.

Dental health statistics have shown that dental caries is a disease which affects virtually all groups of preschool children (Pipes and Rees, 1981). Dental health statistics from the Nutrition Canada survey indicated that at three years of age, 35.4% of Manitoban children had teeth with one or more caries affected deciduous teeth, and that this percentage increased to 66.0% of all preschoolers by four to six years of age (Health Protection Branch, 1977c).

In the absence of further data validating parental reports of the type of snacks consumed most often, there is a continued need to guide parents in making appropriate snack selections, especially parents with small families. The factors influencing maternal selection of appropriate versus inappropriate snacks is unclear from this study as only family size and maternal concern about meat intake were related to the type of snack food offered most frequently.

5.10 SUPPLEMENTATION PRACTICES OF MOTHERS OF PRESCHOOL CHILDREN

The majority of the mothers of preschool children surveyed (64.4%) were giving their preschoolers vitamin/mineral supplements. This result is in agreement with the findings of Owen et al. (1974) who reported that 64% of the 5300 preschool children surveyed were receiving some type of supplement. Beal (1957) also found that 60% of the 65 children surveyed in her longitudinal study were regularly receiving vitamin/mineral supplements. A higher proportion of mothers of preschool children

surveyed by Dierks and Morse (1965) reported giving their children vitamin/mineral supplements (80%). However, the parents surveyed in this study were very highly educated and several reserachers have reported that supplementation practices are positively related to maternal education (Owen et al., 1974; Kerrey et al., 1968).

The parctice of supplementing the diets of preschool children was significantly related to maternal age ($X^2=5.06$;d.f.=1;p=.02), contrary to the formulated null hypothesis (Table 96). Younger mothers were more likely to give their children supplements (71.3%) than women older than thirty years of age (57.6%). This relationship was still significant when examined in the presence of SES ($X^2=4.61$;d.f.=1;p=.03), place of residence ($X^2=4.02$;d.f.=1;p=.04), education ($X^2=3.72$;d.f.=1;p=.05) and employment status ($X^2=4.57$;d.f.=1;p=.002).

When family size and occupational status were controlled, the relationship between maternal age and the practice of supplementing the diets of preschool children was no longer significant. However, an interaction between maternal age and family size, and maternal age and occupational status, amy be confounding the results, even though the interactions were not significant at the 5% level. For example, when occupational status was considered, a higher proportion of younger mothers supplemented their child's diet (Table 97). However, while the same proportion of both low and higher occupational status younger mothers and lower occupational status older mothers used supplements, a lower proportion of higher occupational status older mothers gave their children supplements.

Further, a similar interaction was evident between maternal age and family size, as a lower proportion of older mothers with large families supplemented their child's diet, while the same proportion of younger mothers, regardless of family size, and older mothers of small

TABLE 96

Maternal Practice Of Supplementing The Diets Of Preschool Children In
Relation To Maternal Age

Use Of Supplements		Maternal Age (years)		
		20-30	31-43	TOTAL
Yes	n	87	72	159
	%	71.3	57.6	64.4
No	n	35	53	88
	%	28.9	42.4	35.6
TOTAL	n	122	125	247
	%	100.0	100.0	
% OF TOTAL		49.4	50.6	100.0

$$X^2 = 5.061; d.f. = 1; p = .02$$

TABLE 97

Maternal Practice Of Supplementing The Diets Of Preschool Children In
Relation To Maternal Age And Occupational Status

Occupational Status ¹	Maternal Age			
	20-30		31-43	
	Uses Supplements Y	Uses Supplements N	Uses Supplements Y	Uses Supplements N
Low	35	16	23	12
High	52	19	48	41

¹ excludes one case in which a value was not available

families, used supplements (Table 98). Thus, maternal age is an important variable influencing the maternal practice of supplementing the diets of preschool children.

The maternal practice of supplementing the diets of preschool children was also significantly related ($\chi^2 = 3.982; d.f. = 1; p = .04$) to family size (Table 99). A higher proportion of mothers with small families (69.4%) gave their preschoolers supplements compared to women with three or more children (57.0%), supporting the proposed hypothesis. This relationship was still significant when examined in the presence of em-

TABLE 98

Maternal Practice Of Supplementing The Diets Of Preschool Children In
Relation To Maternal Age And Family Size

Family ¹ Size	Maternal Age			
	20-30		31-43	
	Uses Supplements Y	Uses Supplements N	Uses Supplements Y	Uses Supplements N
Small	66	25	36	20
Large	21	10	36	33

1 small= 1-2 children large= 3-6 children

ployment status ($X^2 = 4.32; d.f. = 1; p = .03$), SES ($X^2 = 4.08; d.f. = 1; p = .04$), place of residence ($X^2 = 4.69; d.f. = 1; p = .03$), and occupational status. However, when maternal age was controlled, maternal use of supplements was not significantly related to family size due to the confounding effects of the interaction between family size and maternal age as discussed previously.

Further, when maternal education was controlled, the relationship between family size and the use of supplements was no longer significant. This result may be explained by a non-significant interaction be-

TABLE 99

Maternal Practice Of Supplementing The Diets Of Preschool Children In
Relation To Family Size

Use Of Supplements		Number Of Children		
		1 - 2	3 - 6	TOTAL
Yes	n	102	57	159
	%	69.4	57.0	64.4
No	n	45	43	88
	%	30.6	44.0	35.6
TOTAL	n	147	100	247
	%	100.0	100.0	
% OF TOTAL		59.5	40.5	100.0

$$X^2 = 3.982; d.f. = 1; p = .04$$

tween family size and maternal education (Table 100). A higher proportion of mothers with small families supplemented the diets of their children. However, while approximately the same proportion of both highly educated and less educated mothers with large families used supplements, a higher proportion of less educated mothers with small families gave their children supplements.

TABLE 100

Maternal Practice Of Supplementing The Diets Of Preschool Children In
Relation To Family Size And Maternal Education

Maternal Education ³	Family Size			
	Small ¹		Large ²	
	Uses Supplements Y	Uses Supplements N	Uses Supplements Y	Uses Supplements N
E+HS	67	26	34	25
C+U	35	19	23	18

¹ 1-2 children

² 3-6 children

³ E+HS=Elementary+High School C+U=College+University

Contrary to the formulated hypothesis, the maternal practice of supplementing the diet of preschool children was significantly related to birthrank ($X^2 = 4.161; d.f. = 1; p = .04$) (Table 101). Mothers were more likely to supplement the diets of firstborn children (72.7%) than later-born children (59.8%).

The practice of giving supplements to preschool children was not related to SES, place of residence, maternal education, or occupational status, in agreement with the findings of Beal (1957). However, these findings are not in agreement with the results of Owen et al. (1974) and Kerrey et al. (1968) who found that the use of supplements was positively associated with socioeconomic status. Further, the gender of the respondents' children was not related to the maternal practice of supplementing the diets of preschool children, disagreeing with the findings of Brault-Dubuc (1982) who found that a greater proportion of French-Canadian male preschool children received supplements. In addition, supporting the proposed null hypothesis, the practice of using supplements was not significantly related to maternal employment status nor the age of the children, to maternal ratings of appetite and willingness to eat, or to any of the eating behaviour concerns expressed by the mothers.

TABLE 101

Maternal Practice Of Supplementing The Diets Of Preschool Children In
Relation To Birthrank

Use Of Supplements		Birthrank		TOTAL
		Firstborn	Laterborn	
Yes	n	64	95	159
	%	72.7	59.8	64.4
No	n	24	64	88
	%	27.3	40.3	35.6
TOTAL	n	88	159	247
	%	100.0	100.0	
% OF TOTAL		35.6	64.4	100.0

$$\chi^2 = 4.161; d.f. = 1; p = .04$$

5.10.1 Type Of Supplementation

The majority (62.9%) of the 159 children receiving supplements were receiving a multivitamin plus iron preparation (Table 102). Most of the remaining children were given a multivitamin (32.7%). Similar to the findings of Owen et al. (1974) and Beal (1957) only a few children were receiving singular supplements of vitamin A, D or C.

TABLE 102

Vitamin/Mineral Supplements Given To Preschool Children

Type Of Supplement	N ¹	%
Multivitamin With Iron	100	62.9
Multivitamin	52	32.7
Ascorbic Acid	5	3.1
Vitamin D	2	1.3
TOTAL	159	100.0

¹ includes 20 subjects who received more than one supplement

Previous studies by Owen et al. (1974) and Beal (1957) reported that multivitamins were the type of supplement most frequently given to preschool children. The results of the current study suggest that a higher proportion of mothers are giving their children iron-containing supplements than previously noted by Owen et al. (1974) and Beal (1957) - 62.9% versus 14.1% and 4%, respectively. It could be speculated that this increase in the use of iron supplements could be the result of an increased knowledge about nutrition on the part of parents as several researchers have shown that iron is the nutrient most likely to be lacking in the diets of preschool children (Health Protection Branch, 1977a; Owen et al., 1974; Dierks and Morse, 1965). However, other factors may be influencing this trend, such as differences in samples studied, age of the children examined, differences in countries (United States versus Canada), different time periods, the type of supplements available to consumers, and the effects of media promotion of iron-containing supplements.

The majority of children receiving supplements were taking only one type of supplement. However, a small but important number of mothers (12.6% of the sample receiving supplements) were giving their children more than one supplement on a regular basis, ranging from two to six different preparations. A seasonal influence may be affecting the type of additional supplements given to preschool children as most of the additional supplements (64%) consisted of vitamin C or D tablets.

5.10.2 Frequency of Supplementation

Most of the children were receiving supplements every day, all year round (49.0%) (Table 103). However, 42.8% of the children received supplements every day only during the winter. This finding does not concur with the results of Dierks and Morse (1965) who reported that 70% of the 115 preschool children surveyed received supplements all of the time and only 10% received supplements only during the winter or on a more occasional basis. When the practice of giving preschool children supplements was divided into two groups representing those children receiving supplements throughout the year versus those receiving supplements only during the winter, the frequency of supplementation was not found to be significantly related to any of the demographic variables examined. Only one child was receiving supplements more than once per day.

TABLE 103

Frequency Of Supplementation

Frequency	N	%
More Than Once A Day/Everyday	1	0.6
Once A Day/All Year	78	49.0
Once A Day/Winter	68	42.8
Few Times A Week	10	6.3
Occasionally	1	0.6
Illness Only	1	0.6
TOTAL	159	100.0

5.10.3 Maternal Reasons For Supplementing The Diet Of Preschool Children

Of the 159 mothers who gave their children supplements, 32.1% did so to ensure that their children were receiving adequate intakes of nutrients (Table 104). Twenty-eight mothers (17.6%) gave their children supplements because they felt their preschoolers needed them due to fussy eating habits. An additional 17.6% of the respondents gave supplements to prevent colds and 8.2% supplemented their children's diets because they believed more nutrients were needed during the winter. A significant number of mothers (18.2%) gave their children supplements because of the recommendation of their physicians. Eppright et al.

(1969) reported a higher percentage of mothers (45%) reported that the physician influenced their supplementation practices. Additional reasons for supplementing the diets of preschool children are noted in Table 105. However, as the respondents were not directly questioned whether supplements were self-prescribed, mothers citing others reasons for using supplements may have been following their physician's recommendation.

TABLE 104

Maternal Reasons For Supplementing The Diets Of Preschool Children

Maternal Reason	N	%
For Extra Insurance	51	32.1
Recommended By Physician	29	18.2
Child A Fussy Eater	28	17.6
To Prevent Colds	28	17.6
Requires More Nutrients In Winter	13	8.2
Recommended By Family/Friends	5	3.1
Nutrients Lost In Storage	2	1.2
Processing Destroys Nutrients	2	1.6
TOTAL	159	100.0

It is evident that the use of supplements with preschool children is a prevalent practice, particularly among younger mothers and in smaller families. The use of supplements was not found to be significantly related to any of the eating behaviour concerns expressed by the mothers, or to maternal ratings of appetite and willingness to eat. This result is surprising as it would be speculated that mothers who were concerned about an inadequate intake of food would be more likely to supplement their child's diet. As supplements are virtually never required by preschool children if their diet is appropriately chosen and prepared (Jones, 1981), and as some of the reasons for supplementing the diets of children were unjustified, nutritionists have been ineffective in educating mothers about appropriate supplementation practices. Without quantitative data on the amount of supplements consumed daily, the hazards associated with this practice cannot be assessed.

5.11 AWARENESS AND IMPLEMENTATION OF PREVENTIVE HEALTH PRACTICES

5.11.1 Awareness Of Relation Of Children's Diet To Health

The majority of the respondents (83.4%) believed that their children's eating habits were important factors in determining their adult health. However, 9.3% of the mothers were uncertain about this issue and 6.3% of the respondents were not aware of the relation of diet to health. Rae and Neilsen (1980) reported similar results as over 80% of the eighteen to fifty-five year old respondents surveyed in the Nutrition Concepts Study believed that better health was the benefit of sensible eating habits. However, whereas the current study investigated maternal awareness of the relation of children's diet to health, Rae and

Neilsen (1980) investigated awareness of the relation of adult diet to health.

Awareness of the relationship between childhood diet and adult health was significantly related to SES ($X^2 = 9.238$; d.f.=1; p=.002), agreeing with the proposed hypothesis (Table 105). A higher proportion of higher SES mothers were aware of this relationship (88.9%) than lower SES respondents (73.8%). This relationship was still significant when examined in the presence of place of residence ($X^2 = 10.69$; d.f.=1; p=.001), family size (8.77; d.f.=1; p=.003), maternal age ($X^2 = 9.26$; d.f.=1; p=.002), and employment status ($X^2 = 7.89$; d.f.=1; p=.005).

In addition, maternal awareness of the relation of diet to health was significantly related ($X^2 = 4.329$; d.f.=1; p=.03) to maternal education (Table 106). Mothers with college and university education were more likely to be aware of this relationship (90.8%) than less educated mothers (80.1%). This relationship was still significant when examined in the presence of family size ($X^2 = 7.30$; d.f.=1; p=.006), employment status ($X^2 = 7.07$; d.f.=1; p=.007), maternal age ($X^2 = 6.87$; d.f.=1; p=.008), place of residence ($X^2 = 7.05$; d.f.=1; p=.007) and occupational status ($X^2 = 4.3$; d.f.=1; p=.03).

Supporting the proposed hypotheses, maternal awareness of the relation of diet to health was not related to occupational status, employment status, maternal age, family size, place of residence, or the the age, gender, and birthrank of the child. However, the results stress the important influence of maternal education on awareness of the relation of diet to health.

TABLE 105

Maternal Awareness Of The Relation Of Diet To Health In Relation To SES

Aware Of Relationship		SES		TOTAL
		Low	Higher	
Yes	n	62	144	206
	%	73.8	88.9	83.7
No	n	22	18	40
	%	26.2	11.1	16.3
TOTAL	n	84	162	246 ¹
	%	100.0	100.0	
% OF TOTAL		34.1	65.9	100.0

¹ excludes one case in which a SES value was not available
 $X^2 = 9.238; d.f. = 1; p = .002$

TABLE 106

Maternal Awareness Of The Relation Of Diet To Health In Relation To
Maternal Education

Aware Of Relationship		Maternal Education		
		HS ¹	U ²	TOTAL
Yes	n	137	69	206
	%	80.1	90.8	83.4
No	n	34	7	41
	%	19.9	89.2	16.6
TOTAL	n	171	76	247
	%	100.0	100.0	
% OF TOTAL		69.2	30.8	100.0

¹ Elementary + High School

² College + University

$\chi^2 = 4.329; d.f. = 1; p = .03$

5.11.1.1 Maternal Perceptions Of How Diet Is Related To Health

Although hypotheses had not been formulated, maternal perceptions of how diet was related to health was examined in relation to the demographic variables considered when sample size was sufficient to permit statistical analyses, in order to determine if specific segments of the population of mothers were aware of different aspects of the relation of diet to health. When the 206 respondents who were aware of the relation of diet to health were asked how diet was related to health, 67% mentioned the importance of forming good eating habits during the preschool years and its relation to adult health (Table 107).

This explanation of the relationship between adult health and early childhood eating habits was significantly related to maternal age ($X^2 = 4.718; d.f. = 4; p = .02$) (Table 108). A higher proportion of younger mothers were aware of the importance of establishing good eating habits in children (74.0%) compared to women older than thirty years of age (59.8%). This relationship was still significant when examined in the presence of SES ($X^2 = 7.31; d.f. = 1; p = .006$), maternal education ($X^2 = 4.81; d.f. = 1; p = .02$), family size ($X^2 = 3.75; d.f. = 1; p = .05$), occupational status ($X^2 = 3.97; d.f. = 1; p = .04$), and place of residence ($X^2 = 4.718; d.f. = 1; p = .02$).

When employment status was controlled for, the relationship between maternal age and mention of the relationship between adult health and the formation of proper eating habits in children was no longer significant. However, this may be explained by the interaction between maternal mention of the relation of health to childhood eating habits, maternal age, and employment status ($X^2 = 7.95; d.f. = 1; p = .004$) (Table 109)

TABLE 107

Maternal Perceptions Of The Relationship Of The Preschool Child's Diet
and Adult Health, N=206

Perception	Number Of Subjects	Percent Of Subjects ¹
Formation Of Eating Habits	138	67.0
Weight Problems	69	33.5
Dental Caries	34	17.0
Overall Health	14	6.5
Growth	11	5.5
Cardiovascular Disease	10	5.0
Hyperactivity	9	4.0
Diabetes	3	1.5
Cancer	2	1.0

¹ totals to more than 100% due to multiple responses

(Appendix L). Of older mothers, respondents employed outside the home were more likely to mention the relationship between childhood food habits and adult health (31:13) than non-employed respondents (30:28). In contrast, non-employed younger mothers were more likely to be aware of

TABLE 108

Maternal Awareness Of The Relation Of The Formation Of Proper Eating
Habits To Adult Health In Relation To Maternal Age

Formation Of Eating Habits		Maternal Age (years)		
		20-30	31-43	TOTAL
Yes	n	77	61	138
	%	74.0	59.8	67.0
No	n	27	41	68
	%	26.0	40.2	33.0
TOTAL	n	104	102	206
	%	100.0	100.0	
% OF TOTAL		50.5	49.5	100.0

$$\chi^2 = 4.718; d.f. = 1; p = .02$$

the relation of childhood eating habits to adult health (52:12) than women employed outside the home (25:15).

Maternal mention of the importance of proper formation of eating habits to adult health was not significantly related to occupational status, SES, maternal education, place of residence, employment status, family size, or the age, gender and birthrank of the child.

The second most frequently mentioned association between diet and health was the relation of eating habits to weight problems. Maternal mention of this relationship was not significantly related to any of the demographic variables examined.

Seventeen percent of the mothers mentioned the association between diet and dental caries. This result agrees with the findings of Linn (1976) who found that only a few of the 147 guardians of young children surveyed knew about the relationship between frequent snacking and dental caries, and that few guardians were concerned about the contribution of diet to dental caries. The number of subjects aware of this relationship in the current sample (N=41) was not large enough to permit statistical analysis.

Only 5% of the respondents mentioned the possible relationship between childhood eating patterns and cardiovascular disease. This finding concurs with the results reported by Mackie (1973) who found that only 3% of the 982 adult Albertans surveyed specifically mentioned the association between diet and cardiovascular disease.

The results suggest that while many mothers of preschool children are aware of the importance of establishing good eating habits in young children, fewer mothers relate proper eating habits to the prevention of

TABLE 109

Maternal Mention Of The Relation Of The Formation Of Proper Eating
Habits During Childhood To Adult Health In Relation To Maternal Age And
Employment Status

Sample	Age ¹	Employed ²	Aware Of Relationship		TOTAL
			Yes	No	
1	Older	Yes	31	13	44
2	Older	No	30	28	58
3	Younger	Yes	25	15	40
4	Younger	No	52	12	64

¹ Younger= 20-30 Older=31-43

² Yes=Fulltime+Parttime No=Not Employed

$\chi^2 = 7.95; d.f. = 1; p = .004$

such diseases as obesity, cardiovascular disease, and dental caries, which are current concerns addressed by the "Nutrition Recommendations For Canadians". Younger mothers were more likely to be aware of the relation of good eating habits formed during the preschool years to later adult health than older women. However, it is possible that mothers aware of the importance of forming good eating habits would have specifically mentioned the relation of eating habits to the prevention of obesity, cardiovascular disease, and dental caries if questioned further.

5.11.2 Dietary Changes Implemented By Mothers Of Preschool Children

The respondents who were aware of the relation of diet to health were asked if they had altered their children's eating habits in the hope of preventing adult health problems, and if so, what changes they had made. Of the 206 mothers who were aware of the relation of diet to health, 85.4% stated that they had attempted to make changes in their children's diet. This percentage is higher than previously reported by other Canadian researchers. However, in the current study, only mothers aware of the relationship between diet and health were asked if they had made changes in their children's diet due to health concerns (Rae and Neilsen, 1980; Charron, 1981; Mackie, 1973). Further, only women were surveyed in the current study and previous surveys have shown that women are more likely to make changes in their eating habits due to health concern than men (Rae and Neilsoe, 1980; Charron, 1981).

Although hypotheses had not been formulated, maternal attempts to change the eating habits of their child were examined in relation to demographic variables to assess which segments of the population of moth-

ers would most benefit from nutrition education. Maternal attempts to change their children's eating habits because of adult health concerns was significantly related to birthrank ($X^2 = 4.763; d.f. = 1; p = .02$) (Table 110). Mothers of firstborn children (92.3%) were more likely to attempt to change their preschoolers' eating habits than mothers with laterborn children (81.2%). This relationship was no longer significant when maternal age and family size were controlled.

Maternal attempts to change their children's eating habits due to adult health concerns was also significantly related to the age of the children ($X^2 = 7.740; d.f. = 1; p = .005$) (Table 111). A higher proportion of mothers of younger children attempted to change their preschoolers' eating habits (96.5%) than mothers of three and four year old children (81.2%).

The SES of the respondents was not related to the mothers' attempts to change their children's eating habits due to health concerns. This finding is inconsistent with previous studies examining health-related behaviour which suggest that people in lower SES groups tend to engage in health promotional behaviour less frequently than people in higher SES groups (Begin, 1979; Hochbaum, 1981; Health and Welfare Canada, 1981). Further, contrary to the findings of Sullivan and Schwartz (1981) and Rae and Neilson (1980), maternal education and maternal age were not significantly related to the respondents' attempts to change their children's eating habits. In addition, maternal attempts to change children's eating habits due to health concerns was not related to occupational status, place of residence, family size, employment status, or the gender of the preschool children.

TABLE 110

Maternal Attempts To Change Preschool Children's Eating Habits Due To
Adult Health Concerns In Relation To Birthrank

Dietary Changes		Birthrank		
		Firstborn	Laterborn	TOTAL
Yes	n	72	104	176
	%	92.3	81.2	85.4
No	n	6	24	30
	%	7.7	18.8	14.6
TOTAL	n	78	128	206 ¹
	%	100.0	100.0	
% OF TOTAL		37.9	62.1	100.0

¹ excludes 41 subjects who were not aware of the
relation of diet to health

$\chi^2 = 4.763; d.f. = 1; p = .02$

TABLE 111

Maternal Attempts To Change Preschool Children's Eating Habits Due To
Adult Health Concerns In Relation To Children's Age

Dietary Changes		Age Of Child (years)		
		2	3 - 4	TOTAL
Yes	n	55	121	176
	%	96.5	81.2	85.4
No	n	2	28	30
	%	3.5	18.8	14.6
TOTAL	n	57	149	206 ¹
	%	100.0	100.0	
% OF TOTAL		27.7	72.3	100.0

¹ excludes 41 cases who were not aware of the relation
of diet to health

$\chi^2 = 7.740; d.f. = 1; p = .005$

5.11.2.1 Changes Implemented Due To Adult Health Concerns

Most of the reported changes were made in the type of foods consumed, such as less sweets, fewer fatty and high salt foods, and as increased consumption of fresh fruits and vegetables (Tables 112). These changes are in general agreement with the "Nutrition Recommendations For Canadians" (Health Protection Branch, 1977b). This result also reinforces the findings of Charron (1981) and Rae and Neilsen (1980) that Canadians are trying to change their own eating habits and those of their families with the goal of improved health.

Although hypotheses had not been formulated, each of the reported maternal dietary changes was considered in relation to the demographic variables examined. Of the mothers who reported attempting to make changes in their children's diet due to health concerns, 74.4% tried to limit their preschoolers' intake of sugar. Charron (1982) found that 44.7% of the adult Quebecers surveyed who reported making changes in their diet during the previous year had tried to consume fewer high sugar foods. The respondents' place of residence was significantly related to this attempted change ($X^2 = 6.387$; d.f.=1; p=.01) (Table 113). A higher proportion of non-metropolitan mothers attempted to limit sugar intake (82.1%) compared to metropolitan residing mothers (65.4%). This relationship was still significant when examined in the presence of SES ($X^2 = 7.70$; d.f.=1; p=.005), family size ($X^2 = 5.97$; d.f.=1; p=.01), maternal age ($X^2 = 5.08$; d.f.=1; p=.02), maternal education ($X^2 = 5.43$; d.f.=1; p=.01), and employment status ($X^2 = 8.29$; d.f.=1; p=.004).

The relationship between place of residence and reported attempted changes to limit sugar intake was no longer significant when occupation-

TABLE 112

Preventive Practices Used By Mothers Of Preschool Children, Who
 Attempted To Make Dietary Changes, N=176

Dietary Changes	Number Of Subjects	Percent Of Subjects ¹
Decreased consumption of sugar	131	74.4
Decreased salt intake	86	48.9
Consume sensible diet	84	47.7
Decreased consumption of cholesterol	15	8.5
Decreased consumption of saturated fats	13	7.4
Maintain physical fitness	6	3.4
Maintain ideal weight	6	3.4
Decrease intake of refined foods	4	2.3
Decreased intake of additives	4	2.3
Increased consumption of vegetables	4	2.3
Increased consumption of PUFA ²	3	1.7
Other	9	5.1

¹ totals to more than 100% due to multiple responses

² polyunsaturated fatty acids

TABLE 113

Reported Maternal Attempts To Decrease The Sugar Intake Of Preschool Children Due To Adult Health Concerns In Relation To Place Of Residence

Decrease Sugar Intake		Place Of Residence		
		M ¹	U + R ²	TOTAL
Yes	n	53	78	131
	%	65.4	82.1	74.4
No	n	28	17	45
	%	34.6	17.9	25.6
TOTAL	n	81	95	176 ³
	%	100.0	100.0	
% OF TOTAL		46.0	54.0	100.0

¹ Metropolitan

² Non-metropolitan

³ includes only subjects attempting to change children's eating habits due to health concerns

$\chi^2 = 6.387; d.f. = 1; p = .01$

al status was controlled. However, a non-significant interaction was causing this effect. (Tables 114). A higher proportion of non-metropolitan mothers reported attempting of decrease sugar intake. However, while the same proportion of both higher and lower occupational status mothers residing in metropolitan areas mentioned this change, a higher proportion of lower occupational status respondents residing in urban and rural areas reported attempting to decrease sugar intake for health reasons.

TABLE 114

Reported Maternal Attempts To Decrease Preschool Children's Sugar Intake Due To Health Reasons In Relation To Place Of Residence And Occupational Status

Occupation Status	Place Of Residence			
	Metropolitan		Non-Metropolitan	
	Y	N	Y	N
High	43	24	39	9
Low	10	4	39	8

Reported maternal attempts to limit sugar intake were not related to SES, maternal age, occupational status, maternal education, employment status, family size, or the age, gender and birthrank of the child.

Eighty-six mothers (48.9%) reported attempting to decrease the salt intake of their preschool children. Thirty-three percent of the adults surveyed by Charron (1981) who reported attempting to make dietary changes reported having used less salt. This practice was significantly related to the respondents' place of residence ($X^2 = 31.059; d.f. = 1; p = .0001$) (Table 115). Metropolitan residing mothers were more likely to try to limit their preschoolers' salt intake (71.6%) than mothers residing in non-metropolitan areas (29.5%). This relationship was still significant when examined in the presence of SES ($X^2 = 23.21; d.f. = 1; p = .0001$), family size ($27.63; d.f. = 1; p = .0001$), maternal age ($X^2 = 28.98; d.f. = 1; p = .0001$), education ($X^2 = 27.42; d.f. = 1; p = .0001$), occupational status ($X^2 = 22.06; d.f. = 1; p = .0001$), and employment status ($X^2 = 28.03; d.f. = 1; p = .0001$).

Further, reported maternal attempts to decrease children's salt intake was significantly related to occupational status ($X^2 = 4.652; d.f. = 1; p = .03$) (Table 116). A higher proportion of respondents with higher occupational scores (54.8%) attempted to decrease their preschoolers' salt intake than mothers with lower occupational status (37.7%). This relationship was still significant when considered in the presence of employment status ($X^2 = 4.53; d.f. = 1; p = .03$), maternal age ($X^2 = 4.45; d.f. = 1; p = .03$), and family size ($X^2 = 3.81; d.f. = 1; p = .05$). However, when maternal education, SES, and place of residence were controlled for, this relationship was no longer significant.

Reported maternal attempts to limit salt were not significantly related to SES, maternal age, maternal education, employment status, family size, or the the age, gender and birthrank of the child.

TABLE 115

Maternal Attempts To Decrease The Salt Intake Of Preschool Children Due
To Adult Health Concerns In Relation To Place Of Residence

Decrease Salt Intake		Place Of Residence		
		M ¹	U + R ²	TOTAL
Yes	n	58	28	86
	%	71.6	29.5	48.9
No	n	23	67	90
	%	28.4	70.5	51.1
TOTAL	n	81	95	176 ³
	%	100.0	100.0	
% OF TOTAL		46.0	54.0	100.0

1Metropolitan

2Non-metropolitan

3includes only mothers attempting changes to their
children's diets

$\chi^2 = 31.059; d.f. = 1; p = .0001$

TABLE 116

Maternal Attempts To Decrease The Salt Intake Of Preschool Children Due
To Adult Health Concerns In Relation To Occupational Status

Decrease Salt Intake		Occupational Status		
		High	Low	TOTAL
Yes	n	63	23	86
	%	54.8	37.7	48.9
No	n	52	38	90
	%	45.2	62.3	51.1
TOTAL	n	115	61	176 ¹
	%	100.0	100.0	
% OF TOTAL		65.3	34.7	100.0

¹ includes only mothers attempting dietary changes

$\chi^2 = 4.652; d.f. = 1; p = .03$

Eighty-four mothers (47.7%) reported attempting to serve their children balanced, sensible diets. This practice was significantly related to the respondents' place of residence ($X^2 = 9.803; d.f. = 1; p = .001$) (Table 117). Metropolitan residing mothers were more likely to try a serve their children balanced diets (60.5%) than non-metropolitan residing mothers (36.8%). This relationship was still significant when examined in the presence of maternal age ($X^2 = 4.28; d.f. = 1; p = .03$), family size ($X^2 = 9.32; d.f. = 1; p = .002$). However, this relationship was no longer significant when SES, occupational status, employment status, and maternal education were controlled.

Reported attempts to serve their children sensible diets were not significantly related to SES, occupational status, maternal education, employment status, maternal age, family size, or the age, gender and birthrank of the child.

Other dietary changes mentioned by nine respondents included decreasing the intake of starchy foods (N=2), replacement of white sugar with honey (N=2), consumption of a variety of foods (N=2), increased consumption of high-fibre foods (N=1), an increased consumption of yogurt (N=1), and not forcing children to eat (N=1). These results suggest that some mothers are confused about the preventive dietary practices which should be implemented as replacing white sugar with honey and decreasing starchy foods are not recommended practices.

The results of the current research indicate that the majority of mothers of preschool children are aware of the relation of diet to health, particularly mothers with higher education. Mothers were aware of the relation of diet to health particularly as it relates to the for-

TABLE 117

Maternal Attempts To Serve Preschool Children Balanced Diets Due To
Adult Health Concerns In Relation To Place Of Residence

Balanced Diet		Place Of Residence		
		M ¹	U + R ²	TOTAL
Yes	n	49	35	84
	%	60.5	36.8	47.7
No	n	32	60	92
	%	39.5	63.2	52.3
TOTAL	n	81	95	176 ³
	%	100.0	100.0	
% OF TOTAL		46.0	54.0	100.0

¹Metropolitan

²Non-metropolitan

³includes only mothers attempting dietary changes

$\chi^2 = 9.803; d.f. = 1; p = .001$

mation of eating habits in young children. However, further nutrition education designed to increase awareness of the relation of diet to cardiovascular disease, obesity, and dental caries is necessary.

Many mothers also reported attempting to make changes in their child's diet for health reasons. Mothers were also more likely to report changing the diet of younger preschool children, suggesting that child characteristics are influencing the implementation of preventive dietary practices.

Most of the changes were in general agreement with the "Nutrition Recommendations For Canadians". Mothers residing in metropolitan areas were more likely to attempt decreasing their child's salt intake and to serve balanced, sensible diets, while non-metropolitan residing mothers were more likely to attempt decreasing sugar intake. It is encouraging that many mothers are willing to make changes in the diets of their children as health promotional dietary practices should ideally be established during the preschool years when attitudes towards food are being formed. Nutrition educators should continue to stress the importance of establishing appropriate preventive dietary practices during the preschool years.

5.12 IMPLEMENTATION OF PREVENTIVE DIETARY PRACTICES

In order to examine more closely whether mothers of preschool children are employing preventive dietary practices, and the reasons for these practices, respondents were questioned about specific practices suggested in the "Nutrition Recommendations For Canadians". The mothers were questioned about weight control practices and their children's

consumption of wholegrain and high sugar cereals, wholegrain breads, low-fat milk, eggs, margarine use, and salt habits. Each preventive dietary practice was examined in relation to the demographic variables examined to answer the hypotheses stated in Section 3.2.2. Further, additional analysis involving the relation of preventive dietary practices to awareness of the relation of diet to health was conducted.

5.12.1 Consumption Of Wholegrain Cereals

Of the 247 mothers surveyed, 96.4% gave their children cereals, either as a breakfast food or as a between-meal snack. The results confirm the findings of the Nutrition Canada Survey in which it was reported that a high percentage of preschool children consume breakfast cereals (Health Protection Branch, 1977a).

The type of cereals consumed most frequently were classified into high sugar and low sugar cereals based on the classification devised by Morgan et al. (1981) in which cereals containing at least 7.7 grams of sucrose per 28 gram serving were considered to have a high sugar content. Cereals containing less than 7.7 grams of sucrose per 28 grams of cereals were classified as having a low sugar content. The breakfast cereals were then classified according to an analysis of the sugar content of Canadian breakfast cereals completed by Korsud and Trick (1977).

Only 10% of the mothers stated that their preschoolers' generally consumed a high sugar cereal. The results concur with the findings of Martinez (1982) who examined the dietary intakes of 172 French-Canadian children, five to six years of age. Presweetened cereals constituted only 12.6% of the cereal intake of lower income children and 18.6% of

more privileged children. The results do not concur with the findings of Anderson (1982), who surveyed 225 parents of preschool children in New Brunswick, and found a higher percentage of parents (29%) purchased presweetened cereals. However, differences between studies, such as the definition of a "presweetened" cereal, age of children studied, and the way the questions were asked, make it difficult to compare studies.

The practice of serving preschool children cereals with a high sugar content was not significantly related to the SES of the family. This finding is contrary to the work of Martinez (1982) and Phillips et al. (1978), who found that families with higher incomes tended to purchase a higher percentage of presweetened cereals. This discrepancy may be due to different criteria for determining SES, as the current study did not determine income. Further, the use of high-sugar cereals was not related to any of the other demographic variables examined, or to maternal awareness of the relation of diet to health.

While most mothers did not usually serve a high-sugar cereal to their preschool children, the majority of the respondents (63.5%) regularly added a sweetener to their child's cereal. While the amount of sugar added to the cereals was not determined, it is possible that some mothers may be adding enough sugar to bring the sugar content of low-sugar cereals into the high-sugar category.

The practice of adding a sweetener to the cereal of preschool children was significantly related to family size ($X^2 = 5.368; d.f. = 1; p = .02$) (Table 118). Mothers of larger families were more likely to add a sweetener to their children's cereal (72.2%) than respondents with only one or two children (57.5%) This relationship was still significant when

examined in the presence of SES ($X^2 = 6.04$;d.f.=1;p=.01), occupational status ($X^2 = 7.17$;d.f.=1;p=.007), place of residence ($X^2 = 6.14$;d.f.=1;p=.01), maternal age ($X^2 = 6.17$;d.f.=1;p=.01), education ($X^2 = 5.91$;d.f.=1;p=.01), and employment status ($X^2 = 5.38$;d.f.=1;p=.02).

Further, the addition of a sweetener to preschool children's cereal was significantly related ($X^2 = 3.788$;d.f.=1;p=.05) to birthrank (Table 119). A higher proportion of mothers of laterborn children (68.0%) added a sweetener to their children's cereal compared to mothers of first-born children (55.3%).

The practice of adding a sweetener to children's cereal was not significantly related to SES, occupational status, maternal education, employment status, maternal age, or place of residence, or the age and gender of the child, supporting the null hypothesis.

Maternal attempts to decrease the sugar intake of their preschool child because of health reasons was not significantly related to the use of low sugar, as opposed to high sugar cereals, or to the practice of adding a sweetener to children's cereal.

TABLE 118

Maternal Practice Of Adding A Sweetener To Preschool Children's Cereal
In Relation To Family Size

Addition Of Sweetener		Number Of Children		
		1-2	3-6	TOTAL
Yes	n	81	70	151
	%	57.5	72.2	63.5
No	n	60	27	87
	%	42.5	27.8	36.5
TOTAL	n	141	97	238 ¹
	%	100.0	100.0	
% OF TOTAL		59.2	40.8	100.0

¹ excludes 9 subjects who did not consume cereal

$\chi^2 = 5.368; d.f. = 1; p = .02$

TABLE 119

Maternal Practice Of Adding A Sweetener To Preschool Children's Cereal
In Relation To Birthrank

Addition Of Sweetener		Birthrank		
		Firstborn	Laterborn	TOTAL
Yes	n	47	104	151
	%	55.3	68.0	63.5
No	n	38	49	87
	%	44.7	32.0	36.5
TOTAL	n	85	153	238 ¹
	%	100.0	100.0	
% OF TOTAL		35.7	64.3	100.0

¹ excludes 9 subjects who did not consume cereal

$\chi^2 = 3.788; d.f. = 1; p = .05$

5.12.2 Type Of Bread Consumed

The type of bread consumed by the preschool children is presented in Table 120 . A wholegrain bread was defined as a bread containing whole wheat or rye flours. Eighty-one children (32.8%) received whole-grain breads. Anderson (1982) also reported that 29% of the 225 preschool children surveyed in New Brunswick consumed wholegrain breads. However, in the current study, an additional 35.2% of the respondents consumed a combination of wholegrain and white breads.

TABLE 120

Type Of Bread Served To Preschool Children

Bread	N	%
Wholegrain	81	32.8
Wholegrain + White	87	35.2
White	79	32.0
TOTAL	247	100.0

The use of wholegrain bread was significantly related to SES ($\chi^2 = 7.764; d.f. = 1; p = .02$) (Table 121). Mothers with an intermediate (76.6%) and high (71.6%) SES were more likely to give their children wholegrain breads than women from a lower SES group (57.1%). This relationship was

still significant when examined in the presence of family size ($X^2 = 7.55; d.f.=1; p=.006$), place of residence ($X^2 = 4.3; d.f.=1; p=.03$) maternal age ($X^2 = 6.10; d.f.=1; p=.01$), and employment status ($X^2 = 6.37; d.f.=1; p=.01$).

The maternal practice of serving children wholegrain breads was also significantly related to the respondents' place of residence ($X^2 = 10.199; d.f.=2; p=.006$) (Table 122). Metropolitan mothers were more likely to serve their preschoolers wholegrain breads (77.7%) than urban (59.1%) and rural (58.5%) residing mothers. When this relationship was considered in the presence of SES ($X^2 = 6.21; d.f.=1; p=.01$), age ($X^2 = 9.63; d.f.=1; p=.001$), family size ($X^2 = 8.64; d.f.=1; p=.003$), employment status ($X^2 = 10.81; d.f.=1; p=.001$), and education ($X^2 = 7.69; d.f.=1; p=.005$). and occupational status ($X^2 = 6.75; d.f.=1; p=.009$) it was still significant.

Further, family size was significantly related ($X^2 = 6.279; d.f.=1; p=.01$) to the practice of serving preschool children wholegrain breads, contrary to the formulated hypothesis (Table 123). A higher proportion of mothers with small families served their preschoolers wholegrain breads (74.1%) than mothers with three or more children (59.0%). When this relationship was examined in the presence of SES ($X^2 = 6.99; d.f.=1; p=.008$), education ($X^2 = 4.97; d.f.=1; p=.02$), place of residence ($X^2 = 4.92; d.f.=1; p=.02$), employment status ($X^2 = 6.50; d.f.=1; p=.01$), maternal age ($X^2 = 7.31; d.f.=1; p=.001$) and occupational status ($X^2 = 5.36; d.f.=1; p=.02$) it was still significant.

The use of wholegrain breads was not significantly related to maternal age, occupational status, maternal education, employment status,

TABLE 121

Maternal Practice Of Serving Wholegrain Breads To Preschool Children In
Relation To SES

Wholegrain Breads		SES			TOTAL
		L ¹	I ²	H ³	
Yes	n	48	59	61	168
	%	57.1	76.6	71.7	68.3
No	n	36	18	24	78
	%	42.9	23.4	28.2	31.7
TOTAL	n	84	77	85	246 ⁴
	%	100.0	100.0	100.0	
% OF TOTAL		34.1	31.3	34.6	100.0

¹ Low

² Intermediate

³ High

⁴ Excludes one case in which a SES value was not available

$\chi^2 = 7.764; d.f. = 1; p = .02$

TABLE 122

Maternal Practice Of Serving Preschool Children Wholegrain Breads In
Relation To Place Of Residence

Wholegrain Breads		Place Of Residence			TOTAL
		M ¹	U ²	R ³	
Yes	n	94	26	48	186
	%	77.7	59.1	58.5	68.0
No	n	27	18	34	79
	%	22.3	40.9	41.5	32.0
TOTAL	n	121	44	82	247
	%	100.0	100.0	100.0	
% OF TOTAL		49.0	17.8	33.2	100.0

¹ Metropolitan

² Urban

³ Rural

$\chi^2 = 10.199; d.f. = 2; p = .006$

TABLE 123

Maternal Practice Of Serving Preschool Children Wholegrain Breads In
Relation To Family Size

Wholegrain Breads		Number Of Children		
		0-2	3-6	TOTAL
Yes	n	109	59	168
	%	74.1	59.0	68.0
No	n	38	41	79
	%	25.9	41.0	32.0
TOTAL	n	147	100	247
	%	100.0	100.0	
% OF TOTAL		59.5	40.5	100.0

$$X^2 = 6.279; d.f. = 1; p = .01$$

or the age, gender and birthrank of the preschool child, supporting the proposed null hypothesis.

The maternal practice of serving preschool children wholegrain breads was also significantly related ($X^2=6.376$;d.f.=1;p=.01) to maternal awareness of the relation of diet to health (Table 124). Mothers who were not aware of the relation of diet to health were less likely to serve their children wholegrain breads (51.1%) than mothers who were aware of the relationship (71.4%). As maternal awareness of the relation of diet to health was significantly related to SES and maternal education, this relationship was examined in the presence of SES ($X^2=3.80$;d.f.=1;p=.05) and maternal education ($X^2=4.59$;d.f.=1;p=.03) and was still significant.

5.12.2.1 Maternal Reasons For Serving Wholegrain Breads To Preschool Children

The majority of mothers who served their children wholegrain breads did so because wholegrain breads were "healthier" (Table 125). However, only 8.9% of the respondents specifically referred to the higher fibre content of wholegrain breads, and none of the respondents mentioned the higher nutrient content. However, the respondents were not specifically asked about the nutritional benefits of wholegrain breads. Taste was also an important factor influencing 29.2% of the mothers.

The results of the current study suggest a trend for mothers to follow the "Nutrition Recommendations For Canadians" and serve their preschool children wholegrain breads. Mothers with smaller families and mothers aware of the relation of diet to health were more likely to implement this practice. Nutritionists should encourage this trend by di-

TABLE 124

Maternal Practice Of Serving Preschool Children Wholegrain Breads In
Relation To Maternal Awareness Of The Relation Of Diet To Health

Wholegrain Breads		Diet Related To Health		
		Yes	No	TOTAL
Yes	n	147	21	168
	%	71.4	51.2	68.0
No	n	59	20	79
	%	28.6	48.8	32.0
TOTAL	n	206	41	247
	%	100.0	100.0	
% OF TOTAL		83.4	16.6	100.0

$$\chi^2 = 6.367; d.f. = 1; p = .01$$

TABLE 125

Maternal Reasons For Serving Wholegrain Breads To Preschool Children

Reason	Number Of Subjects	Percent Of Subjects
Healthier	88	52.4
Taste	49	29.2
Fibre Content	15	8.9
Variety In Diet	9	5.4
No Reason	4	2.4
Don't Know	2	1.2
Allergies	1	0.6
TOTAL	168	100.0

recting nutrition education programs to non-metropolitan and lower SES mothers and mothers with large families. Increasing awareness of the relation of diet to health may also have positive benefits.

5.12.3 Type Of Milk Consumed

The majority of the children (55.5%) were drinking low-fat milk - primarily two-percent milk (Table 126). This proportion of respondents is higher than that reported by Anderson (1982) who reported that 48% of

the 225 preschool children surveyed in New Brunswick consumed two-percent milk and 48% whole milk.

TABLE 126

Type Of Milk Used By Preschool Children

Type Of Milk	Number Of Subjects	Percent Of Subjects
Skim	11	4.9
2 %	135	50.6
Whole	97	39.4
Chocolate	1	0.4
No milk	3	1.2
TOTAL	247	100.0

The type of milk served to preschool children was significantly related to the respondents' place of residence ($\chi^2 = 5.976; d.f. = 2; p = .05$) (Table 127). A higher proportion of metropolitan (65.5%) and urban (65.9%) residing mothers served their children low-fat milk than rural mothers (49.4%). Many of the non-metropolitan respondents mentioned that they purchased their milk directly from the farmer and therefore their choice of low-fat milk was restricted. When SES, education, em-

ployment status, occupational status, maternal age, and family size were controlled, the relationship between place of residence and the use of low-fat milk was no longer significant. Therefore, the respondents' place of residence is not a unique predictor of the maternal practice of serving low-fat milk.

The use of low-fat milk was not related to SES, occupational status, family size, maternal education, maternal age, employment status, or the age, gender, and birthrank of the child, or maternal awareness of the relation of diet to health, supporting the formulated hypotheses. Therefore factors other than the demographic variables examined in this study are influencing the type of milk served to preschool children.

5.12.3.1 Maternal Reasons For Serving Low-Fat Milk

Respondents who served their children low-fat milk (skim plus two percent), were asked why they served that type of milk. Fifty-two of the mothers (35.6%) stated that they served low-fat milk because of the lower fat content (Table 128). Ten percent of the mothers served low-fat milk because of the lower caloric content. Six percent of the respondents stated that they served low-fat milk because their physician recommended this practice. Taste was also an important factor affecting maternal use of low-fat milk.

TABLE 127

Maternal Practice Of Serving Low-Fat Milk To Preschool Children In
Relation To Place Of Residence

Low-Fat Milk ¹	Place Of Residence				TOTAL
		M ²	U ³	R ⁴	
Yes	n	78	29	40	147 ¹
	%	65.5	65.9	49.4	60.3
No	n	41	15	41	97
	%	34.5	34.1	50.6	39.7
TOTAL	n	119	44	81	244 ⁵
	%	100.0	100.0	100.0	
% OF TOTAL		48.8	18.0	33.2	100.0

¹ Low-fat=skim + 2%

² Metropolitan

³ Urban

⁴ Rural

⁵ excludes 3 cases who did not consume milk

$\chi^2 = 5.796; d.f. = 2; p = .05$

TABLE 128

Maternal Reasons For Serving Low-Fat¹ Milk To Preschool Children

Reason	Number Of Subjects	Percent Of Subjects
Lower Fat Content	52	35.6
Taste	42	28.8
Less Calories	15	10.3
Cost	11	7.5
Habit	10	6.8
Physician Recommended	9	6.2
Milk Allergies	6	4.1
Infant In Family	1	0.7
TOTAL	146	100.0

¹ skim + 2% milk

5.12.4 Egg Consumption

The majority of children consumed 1/2 to 4 eggs a week, as an average intake (Table 129). Almost 17% of the children generally did not eat eggs. The number of eggs consumed by the children was not significantly related to any of the demographic variables examined. Other de-

demographic variables not examined in this study may be influencing the number of eggs served to preschool children.

TABLE 129

Number Of Eggs Consumed By Preschool Children In One Week

Number Of Eggs	Number Of Subjects	Percent Of Subjects
None	14	5.7
1/2 - 2	72	29.1
2 1/2 - 4	96	38.9
4 1/2 - 6	52	21.0
> 6	13	5.3
TOTAL	247	100.0

5.12.4.1 Maternal Reasons For Limiting Egg Intake

Thirty of the mothers (12.2%) stated that they tried to limit the number of eggs their preschoolers consumed. This practice was not related to any of the demographic variables examined, but was positively related to maternal awareness of the relation of diet to health ($\chi^2 = 4.341; d.f. = 1; p = .03$) (Table 130). A higher proportion of mothers aware of the relation of diet to health restricted their children's egg intake (14.1%) compared to mothers not aware of the relationship (2.4%) This

relationship was still significant when examined in the presence of SES ($X^2 = 3.65; d.f. = 1; p = .05$) and maternal education ($X^2 = 4.23; d.f. = 1; p = .04$), two variables related to maternal awareness of diet to health.

The majority of the mothers limited egg consumption due to cholesterol (Table 131) . An additional 6.7% of the mothers believed that too many eggs were unhealthy. Maternal confusion about egg consumption is not unexpected as a survey by the Manitoba Egg Producers' Marketing Board (1982) found that even physicians and home economics teachers were ill-informed about the cholesterol issue. In addition, the media have extensively promoted an awareness of cholesterol, particularly American media.

TABLE 130

Maternal Practice Of Limiting The Egg Consumption Of Preschool Children
In Relation To Maternal Awareness Of The Relation Of Diet To Health

Restricts		Diet Related To Health		
		Yes	No	TOTAL
Eggs	n	29	1	30
	%	14.1	2.4	12.2
No	n	177	40	217
	%	85.9	97.6	87.8
TOTAL	n	206	41	247
	%	100.0	100.0	
% OF TOTAL		83.4	16.6	100.0

$$\chi^2 = 4.341; d.f. = 1; p = .03$$

TABLE 131

Maternal Reasons For Limiting The Egg Consumption Of Preschool Children

Reason	Number Of Percent Of	
	Subjects	Subjects
High In Cholesterol	17	56.7
Allergies	5	16.7
Family History Of Heart Disease	3	10.0
Too Many Eggs Unhealthy	2	6.7
Family Member On Low-Cholesterol Diet	2	6.7
To Provide Variety In Diet	2	6.7
Eggs Difficult To Digest	1	3.3
TOTAL	30	100.0

5.12.5 Tablespread Consumption

The majority of mothers served their children margarine rather than butter (Table 132). The use of margarine was not significantly related to any of the demographic variables examined, or to maternal awareness of the relation of diet to health.

TABLE 132

Type Of Tablespread Used By Mothers Of Preschool Children

Tablespread	Number Of Subjects	Percent Of Subjects
Margarine	160	64.7
Margarine + Butter	26	10.5
Butter	57	23.2
Neither	4	1.6
TOTAL	247	100.0

5.12.5.1 Maternal Reasons For Serving Margarine

While most preschool children were served margarine, most mothers did not use margarine for health reasons (Table 133). While 4.8% of the respondents who served their children margarine stated margarine was healthier, only one mother specifically mentioned the higher polyunsaturated fat content of margarines. Rather, the majority of mothers served margarine because of the lower cost. The importance of economic influences on food choices is also illustrated by the findings of Rae and Neilsen (1980) who noted that just under 50% of the respondents surveyed in the Nutrition Concepts Study considered the cost of food to be a major factor in food selection. Once again, taste was an important factor, mentioned by 12.9% of the mothers.

TABLE 133

Maternal Reasons For Serving Margarine To Preschool Children

Reason	Number Of Subjects	Percent Of Subjects
Cost	113	60.7
Taste	24	12.9
No Reason	15	8.1
Lower In Cholesterol	12	6.4
Healthier	9	4.8
Easier To Spread	5	2.7
Lower In Calories	4	2.1
Low Cholesterol Diet	3	1.6
Higher In Polyunsaturates	1	0.5
TOTAL	186	100.0

Once again, some mothers expressed a concern about the cholesterol content of tablespreads, as 6.4% of respondents served margarines because they were lower in cholesterol. It is possible that mothers who stated they served margarine because it was "healthier" would have mentioned the health benefits of polyunsaturated fatty acids if questioned further. However, as only a small percentage of mothers served marga-

rine because of health reasons, the results suggest a need for parents of preschool children to become more aware of the health benefits of polyunsaturated fatty acids and use this as a criterion for choosing tablespreads.

5.12.6 Salting Habits Of Preschool Children

As the "Nutrition Recommendations For Canadians" suggest that all people, two years of age and older, should consume salt in moderation, the salting habits of the preschool children were investigated. The mothers were asked if they salted their children's food while cooking, at the table, or in both cases. The results indicate that a small percentage of mothers (8.5%) did not use salt on their child's food (Table 134). However, 29.9% salted their child's food both at the table and during cooking. The remaining respondents (61.5%) used salt only in cooking or only at the table.

A higher proportion of mothers in this study were limiting their child's salt intake than reported by Frank et al. (1978). The Swedish researchers found that only 25% of 185 ten-year old children surveyed had their food salted only during cooking, in contrast to 45.7% of the respondents surveyed in the current study. However, the findings of the current research is limited by lack of quantitative data on the children's actual salt intake. Further, some respondents may have given a socially acceptable response. Therefore, the results must be interpreted with caution.

The maternal practice of restricting preschool children's salt intake (restricted intake: no salt, table only, cooking only) was signifi-

TABLE 134

Maternal Practice Of Salting Preschool Children's Food

Salting Habits	Number Of Subjects	Percent Of Subjects
Cooking Only	113	45.7
Cooking and Table	74	29.9
Table Only	39	15.8
No Salt	21	8.5
TOTAL	247	100.0

cantly related to the respondents' place of residence ($X^2 = 6.607; d.f.=1; p=.01$) (Table 135). A higher proportion of metropolitan residing mothers limited their children's salt intake (77.7%) than non-metropolitan respondents (62.7%). This relationship was still significant when examined in the presence of education ($X^2 = 6.50; d.f.=1; p=.01$), SES ($X^2 = 6.61; d.f.=1; p=.01$), occupational status ($X^2 = 7.28; d.f.=1; p=.007$), family size ($X^2 = 4.98; d.f.=1; p=.02$), employment status ($X^2 = 4.71; d.f.=1; p=.03$) and maternal age ($X^2 = 4.45; d.f.=1; p=.04$).

The practice of restricting salt was not related to family size, occupational status, employment status, maternal age, maternal education; the age, gender and birthrank of the child; or to maternal awareness of the relation of diet to health.

TABLE 135

Maternal Practice Of Limiting Preschool Children's Salt Intake In
Relation To Place Of Residence

Restriction Of Salt ¹		Place Of Residence		
		M ²	U + R ³	TOTAL
Yes	n	94	79	173
	%	77.7	62.7	70.0
No	n	27	47	74
	%	22.3	37.3	30.0
TOTAL	n	121	126	247
	%	100.0	100.0	
% OF TOTAL		49.0	51.0	100.0

¹ limited salt intake: no salt, cooking only, table only

¹ Metropolitan

² Non-metropolitan

$\chi^2 = 6.607; d.f. = 1; p = .01$

As a means of checking the reliability of the mothers' responses, the maternal practice of restricting salt was related to the mothers' statement of changes made in their child's food habits to decrease risk for adult health problems. The maternal practice of limiting the salt intake of preschool children was significantly related to the mothers' statement of changes made in the child's food habits to decrease risk of adult health problems ($\chi^2 = 34.131; d.f. = 1; p = .0001$) (Table 136). Mothers who stated that they had attempted to decrease their children's salt intake were more likely to report a limited intake of salt (46.5%) than mothers who did not attempt this dietary change for health reasons (8.0%).

5.12.6.1 Maternal Reasons For Limiting Salt

Eighty-three mothers (48.1%) stated that they limited the salt intake of their preschool child because too much salt was unhealthy (Table 137). Few respondents specifically related the consumption of a high salt diet to heart disease or hypertension, however the mothers were not questioned specifically on this association. The results however suggest a trend for mothers of preschool children to follow the "Nutrition Recommendations For Canadians" and limit the salt intake of their preschool children.

TABLE 136

Maternal Restriction Of The Salt Intake Of Preschool Children In
Relation To Maternal Attempts To Limit Salt For Health Reasons

Restriction Of Salt	Attempts To Limit Salt			TOTAL
		Yes	No	
Yes	n	80	6	86
	%	46.5	8.0	34.8
No	n	93	68	161
	%	53.5	92.0	65.2
TOTAL	n	173	74	247
	%	100.0	100.0	
% OF TOTAL		69.6	30.4	100.0

$$X^2 = 34.131; d.f. = 1; p = .0001$$

TABLE 137

Maternal Reasons For Limiting The Salt Intake Of Preschool Children

Reason	Number Of Subjects ¹	Percent Of Subjects
Too much salt unhealthy	88	48.1
Not an acquired taste of family	24	13.1
Not a habit of family	22	12.0
Related to heart disease	12	6.6
Family member on low-salt diet	12	6.6
Child does not like taste	8	4.4
Physician recommended	8	4.4
Retains water	7	3.8
Destroys vitamins	2	1.1
TOTAL	183	100.0

¹ limited salt intake=no salt, cooking only, table only

5.12.7 Weight Control Practices

The majority of the mothers (89.8%) perceived their children to be at their proper weight. Twelve mothers (4.9%) thought their preschoolers were overweight and 5.3% underweight. The data must be treated with caution as the validity of self-reports can be questioned. Maternal

perception of their child's weight was not associated with any of the demographic variables examined.

Of the mothers who considered their children to be at their proper weight, 81.4% reported they did not do anything to help their children maintain a desirable weight. Only 18.6% of the mothers reported they adopted the following weight practices to prevent their children from developing a weight problem:

- limiting high sugar foods (N=16);
- keeping children physically active (N=15);
- limiting consumption of high fat foods (N=4);
- limiting the consumption of snacks (N=1);
- and use of low-calorie cooking methods (N=1).

Maternal use of preventive weight control practices was not related to any of the demographic variables examined, or to maternal awareness of the relation of diet to health.

Maternal awareness of the importance of physical activity during early childhood years is encouraging. However, only a small percentage of mothers mentioned this practice, despite the fact that several researchers have suggested that obesity in children is often the result of hypoactivity rather than hyperphagia, and that exercise habits are formed during early childhood (Dwyer and Mayer, 1973; Bailey, 1973; Griffiths and Payne, 1976). Hopefully, proper exercise habits and other weight control practices will spread to other mothers of preschool children. Nutrition education can encourage this spread.

When mothers were asked what they would do if their preschoolers developed a weight problem, 38% reported that they would contact a phy-

sician or nutritionist before implementing a weight control program (Table 138). The majority of the remaining responses - such as decreasing the consumption of high sugar foods, increasing physical activity - are generally consistent with practices nutritionists would recommend for weight control in preschool children. Fortunately, few respondents (17.5%) reported that they would use special diets. It is generally agreed that the energy and protein content of a preschool child's diet should not be restricted since growth may be compromised (Brownell and Stunkard, 1978; Knittle, 1972; Winick, 1978; American Academy of Pediatrics, 1967).

Of the thirteen mothers (5.3%) who thought their children were underweight, 44.5% of these children had been diagnosed as underweight by their physician. Only 30.8% of the mothers attempted to correct this weight problem. The practices they implemented were in general agreement with recommended practices to correct underweight in young children:

Increase total food intake	2
Feed extra servings	1
Increase number of snacks	1

Of the twelve mothers who perceived their children to be overweight, only 18.0% of those were classified by their physicians to be overweight. Only 25% of the mothers attempted to correct this weight problem, employing the following practices:

Limit high fat foods	1
----------------------	---

TABLE 138

Practices Mothers Of Preschool Children Would Employ If Their Preschool
Children Developed Weight Problems, N=234

Practice	N	%
Contact health professional	85	36.3
Limit desserts, sweets	78	33.3
Decrease food consumed	44	18.0
Try special diet	41	17.5
Limit snacks	36	15.3
Increase physical activity	20	8.5
Don't push food	4	1.7
Use low-fat milk	3	1.2
Limit starchy foods	2	0.8

Consult physician	1
Limit desserts	2
Low-calorie cooking methods	1
Try special diet	1

The results indicate a small but important number of mothers are aware of the importance of preventing obesity through diet and exercise. Health professionals should be encouraged by this finding. However, nutritionists should continue to motivate others to follow these practices by emphasizing the importance of maintaining ideal body weight throughout the lifecycle, as over 80% of the respondents did not follow weight maintenance practices

An assessment of the preventive dietary practices reported to be implemented by mothers of preschool children suggests that many mothers of preschool children were implementing dietary practices in agreement with the "Nutrition Recommendations For Canadians" including: use of wholegrain breads, especially by mothers residing in metropolitan areas, higher SES mothers, and mothers with small families; use of low-fat milk; use of low sugar cereals; use of salt only at the table or cooking, particularly by metropolitan mothers; and not restricting egg consumption due to concern about cholesterol. However, the results indicated that there are changes necessary in the practices employed by mothers. Changes that could be implemented include: decreasing the addition of a sweetener to cereals, advice especially required by mothers with large families; decreasing the restriction of eggs and butter due to concern about cholesterol; increasing the nonuse of salt; and in-

creasing the number of mothers aware of the importance of maintaining an ideal body weight.

Further, the reasons for serving certain foods such as wholegrain breads and margarines were not always health related, as maternal awareness of the relation of diet to health was not related to the maternal practice of serving low-sugar cereals, margarine, low-fat milk, the restriction of salt, or the non-addition of a sweetener to the child's cereal. Maternal awareness of the relation of diet to health was significantly related only to the use of wholegrain breads and maternal restriction of eggs. It is possible that the importance of consuming high fibre foods and limiting cholesterol intake have received more media attention than other preventive dietary practices specified by the "Nutrition Recommendations For Canadians".

Cost or taste were factors influencing some mothers in choosing to serve their children margarine, wholegrain breads, low-fat milks and for limiting salt. Certainly, nutrition education cannot only appeal to the public's concern about preventive health to change dietary habits, but must also emphasize the taste and possible economic advantages of recommended practices.

5.13 SOURCES OF NUTRITION INFORMATION

5.13.1 Number Of Information Sources Used By Mothers Of Preschool Children

A wide range of information sources were used by the mothers, ranging from zero to ten sources (mean number of sources=3.8). The results concur with the findings of Shipman and McCannon (1964) who reported a range of zero to nine information sources utilized by urban Wisconsin homemakers.

The number of nutrition information sources used by each respondent were grouped into two categories representing four or fewer information sources and more than four information sources. Only 32.4% of subjects used more than four sources of information.

The number of sources of nutrition information used by the mothers was significantly related to the respondents' place of residence ($X^2 = 4.512; d.f. = 1; p = .03$) (Table 139). A higher proportion of metropolitan mothers used more than four sources of information (38.8%) compared to non-metropolitan respondents (26.2%). This relationship was still significant when examined in the presence of employment status ($X^2 = 5.23; d.f. = 1; p = .02$), family size ($X^2 = 4.02; d.f. = 1; p = .04$), maternal education ($X^2 = 4.51; d.f. = 1; p = .03$), and maternal age ($X^2 = 4.75; d.f. = 1; p = .02$).

The relationship was no longer significant when SES was controlled. This result was due to an interaction between SES and place of residence, although the interaction was not significant at the 5% level (Table 140). Of metropolitan mothers, higher SES mothers tended to use more information sources than lower SES mothers. In contrast, the same proportion of lower and higher SES mothers residing in non-metropolitan areas used more than four sources of information.

Further, the relationship between place of residence and the number of information sources used by the mothers was no longer significant when examined in the presence of occupational status. However, the results were confounded due to an interaction between occupational status and place of residence. While a higher proportion of higher occupation-

TABLE 139

Number of Nutrition Information Sources Used By Mothers Of Preschool
Children In Relation To Place Of Residence

Number Of Sources		Place Of Residence		
		M ¹	U + R ²	TOTAL
0 - 4	n	74	93	167
	%	61.2	73.8	67.6
5 - 10	n	47	33	80
	%	38.8	26.2	32.4
TOTAL	n	121	126	247
	%	100.0	100.0	
% OF TOTAL		49.0	51.0	100.0

¹ M=metropolitan

² U + R=non-metropolitan

$\chi^2 = 4.512; d.f. = 1; p = .03$

TABLE 140

Number Of Information Sources Used By Mothers Of Preschool Children In
Relation To SES and Place Of Residence

SES	Place of Residence			
	Metropolitan		Non-Metropolitan	
	Number Of Sources ¹		Number Of Sources	
	0-4	5-10	0-4	5-10
Higher	56	37	51	18
Lower	18	9	42	15

¹ excludes one case in which a SES value was not available

al status mothers residing in metropolitan areas used more than four information sources, the same proportion of lower and higher occupational status mothers living in non-metropolitan areas used more than four sources of information (Table 141).

Maternal age was not significantly related to the number of nutrition information sources utilized by the mothers. This result is contrary to the findings of Shipman and McCannon (1964) who surveyed a wider age range of homemakers, and found that women less than thirty-five years of age tended to use a greater number of sources than older women.

TABLE 141

Number Of Information Sources Used By Mothers Of Preschool Children In
Relation To Place Of Residence And Occupational Status

Occupation & Status ¹	Place Of Residence				Number Of Sources
	Metropolitan		Non-Metropolitan		
	0-4	5-10	0-4	5-10	
Higher	57	40	45	18	
Lower	17	6	48	15	

¹ excludes one case in which a value was not available

The number of information sources utilized by mothers of preschool children was not significantly related to SES, occupational status, family size, employment status and education, or the age, gender, and birthrank of the child, supporting the null hypothesis.

The number of nutrition information sources used by the mothers was examined in relation to maternal awareness of the relation of diet to health, although hypotheses had not been formulated. Further, as it could be speculated that that information channels could be affecting dietary practices implemented by the respondents, the number of informa-

tion sources used was examined in relation to preventive dietary practices reported to be implemented, vitamin/mineral use, type of food treat given most often, and the type of snack offered most often.

The number of information sources used by the mothers was not significantly related to maternal awareness of the relation of diet to health. However, the number of sources used was related to implementation of several preventive dietary practices. The use of wholegrain breads was significantly related to the number of information sources used by the mothers ($X^2 = 11.410$; d.f.=1; $p=.0007$) (Table 142). Mothers who used wholegrain breads were more likely to use more than four sources of information. This relationship was still significant when place of residence was controlled ($X^2 = 8.66$; d.f.=1; $p=.0033$), being related to the number of information sources used.

The number of information sources used by the mothers was not significantly related to the use of low sugar cereals, the addition of sweetener to cereal, low-fat milk, margarine, salt habits, use of supplements, the type of food treat offered most often, or to the type of snack food given most often.

TABLE 142

Maternal Practice Of Serving Wholegrain Breads To Preschool Children In
Relation To The Number Of Nutrition Information Sources Used

Wholegrain Breads		Number Of Information Sources		
		0-4	5-10	TOTAL
Yes	n	102	66	168
	%	61.1	82.5	68.0
No	n	65	14	79
	%	38.9	17.5	32.0
TOTAL	n	167	80	247
	%	100.0	100.0	
% OF TOTAL		67.6	32.4	100.0

$$\chi^2 = 11.410; d.f. = 1; p = .0007$$

5.13.2 Type Of Information Sources Used By Mothers Of Preschool Children

The information sources reported to be used by the mothers to obtain nutrition information were divided into three categories representing professional, personal, and media sources (Table 143). Media sources were frequently reported, representing 41.4% of the responses. Personal sources of nutrition information also proved to be popular, mentioned by 40.4% of the mothers. Only 18.2% of the total number of information sources reported consisted of professional sources of information. The results are similar to the findings of Sullivan and Schwartz (1981) who, using the same criteria for classifying the type of information source used, found that media information sources were the most frequently mentioned sources of nutrition information for Vancouver mothers of infants. In addition, the findings concur with the results of Metheny et al. (1962b) who reported that 21% of mothers of preschool children listed health professionals as a major source of nutrition information.

5.13.2.1 Type Of Nutrition Information Source Used Most Often By Mothers Of Preschool Children

Personal and media sources of nutrition information were used most often by the mothers of preschool children, (Table 144). Only twenty-six respondents (10.6%) reported that they obtained nutrition information most often from professional sources. The results agree with the findings of several researchers who have shown that mothers of young children rely extensively on personal and media sources to obtain in-

TABLE 143

Type Of Information Sources Used By Mothers Of Preschool Children

		N	% ²
PROFESSIONAL	18.2 ¹		
	Physician	66	41.0
	Nurses	64	39.8
	Home Economics Teacher	17	10.6
	Nutritionist	12	7.5
	Dentist	2	1.2
PERSONAL	40.4		
	Common Sense	107	30.2
	Education System	68	19.2
	Friends	58	16.4
	Mother	54	15.3
	Prenatal Class	42	11.9
	Weight Control Group	11	3.1
	Husband	3	0.8
	Daycare	3	0.8
	Fitness Class	2	0.6
	Health Food Store	2	0.6
	Church	2	0.6
	La Leche League	1	0.3
	Cooking Class	1	0.3
MEDIA	41.1		
	Pamphlets	108	30.0
	Magazines	98	27.2
	Books	61	16.9
	Canada's Food Guide	42	11.7
	Television/Radio	31	8.6
	Cookbooks	19	5.3
	Lectures/Displays	1	0.3

¹ expressed as percent of total number of responses

² expressed as % of total number of information sources reported
in each type of nutrition information source

formation on nutrition, rather than contacting a health professional (Metheny et al., 1962b; Sullivan and Schwartz, 1981; Schwartz and Barr, 1977; Eppright et al., 1972).

TABLE 144

Type Of Nutrition Information Source Used Most Often By Mothers Of
Preschool Children

Information Source	N ¹	%
Professional	26	10.6
Personal	118	48.2
Media	101	41.2
TOTAL	245	100.0

¹ excludes two cases who did not report
an information source

The type of information source used most often by the mothers was significantly related to SES ($X^2 = 9.047; d.f. = 2; p = .01$) (Table 145). Mothers with lower SES scores were more likely to contact health professionals to obtain nutrition information (17.9%) than respondents with a

higher SES (6.9%). This finding does not support the proposed hypothesis. This relationship was still significant when examined in the presence of family size ($X^2 = 9.16$; d.f.=1; $p=.01$), place of residence ($X^2 = 8.81$; d.f.=1; $p=.01$), maternal education ($X^2 = 6.56$; d.f.=1; $p=.03$), maternal age ($X^2 = 8.17$; d.f.=1; $p=.01$), occupational status ($X^2 = 10.72$; d.f.=1; $p=.004$), and employment status ($X^2 = 8.17$; d.f.=1; $p=.01$). This result suggests that a different locus of control for health-related information seeking may exist for mothers of different SES backgrounds, consistent with the hypothesis of Wallston and Maides (1976). The use of health professionals to obtain nutrition information implies a delegation of responsibility and the belief that health status is beyond one's control. The use of personal sources and print media allows a more independent and self-directed seeking of nutrition information and a belief in control over one's own health behaviour. It could be speculated that lower SES mothers believe that they have less control over their own health behaviour and are therefore less inclined to independently seek health-related information, preferring to rely on the advice of health professionals.

However, the results disagree with the findings of several studies conducted in the 1950's and 1960's in which it was reported that lower SES homemakers were less likely to contact health professionals to obtain information on nutrition (Young et al., 1956; Wage, 1967; Lyle, 1959; Lionberger, 1949). The Canada Health Survey also found that people with higher incomes were more likely to contact a health professional on a routine basis (Health and Welfare Canada, 1981). Differences in assessing SES (maternal education and occupation of main wage earner in the present study versus income) may be affecting the results.

TABLE 145

Type Of Nutrition Information Source Used Most Often By Mothers Of
Preschool Children In Relation To SES

Source Used Most Often		SES		TOTAL
		Low	Higher	
Professional	n	15	11	25
	%	17.9	6.9	10.7
Personal	n	32	85	117
	%	38.1	53.1	48.0
Media	n	37	64	101
	%	44.0	40.0	41.4
TOTAL	n	84	160	244 ¹²
	%	100.0	100.0	
% OF TOTAL		43.4	85.6	100.0

¹ excludes 1 cases in which an SES value was not available

² excludes 2 cases who did not report an information source

$\chi^2 = 9.047; d.f. = 2; p = .01$

The type of information source used most often by mothers of preschool children was also significantly related ($\chi^2 = 6.695; d.f. = 2; p = .03$) to the gender of the preschool children, contrary to the formulated hypothesis (Table 146). A higher proportion of mothers of male children (56.0%) used personal sources of information compared to mothers of female preschoolers (40.5%). No explanation is available to explain this observation.

Further, the type of information source used most often was significantly related to the age of the preschool children ($\chi^2 = 5.715; d.f. = 2; p = .05$) (Table 147). Mothers of two year old children tended to use personal sources (62.6%) more often than media sources (30.3%), whereas mothers of older children relied about equally on personal and media information sources. However, there was no difference in the proportion of mothers who used professional sources of information, supporting the proposed hypothesis.

In regards to other demographic variables, the type of information source used most often was not significantly related to occupational status, employment status, family size, maternal age, maternal education, place of residence, or the birthrank of the child, supporting the proposed hypothesis. Further, although hypotheses had not been formulated, the type of information source used most often was examined in relation to maternal eating behaviour concerns and ratings of appetite and willingness to eat in order to determine if health professionals have been effective in alleviating parental concerns. The type of information source used most often was not related to maternal ratings of appetite and willingness to eat.

TABLE 146

Type Of Information Sources Used Most Often By Mothers Of Preschool
Children In Relation To Gender

Source Used Most Often		Gender		TOTAL
		Female	Male	
Professional	n	16	10	26
	%	12.2	8.6	10.4
Personal	n	53	65	118
	%	40.5	56.0	48.0
Media	n	62	39	101
	%	47.3	35.3	41.4
TOTAL	n	131	114	245 ¹
	%	100.0	100.0	
% OF TOTAL		53.0	47.0	100.0

¹ excludes 2 cases who did not report an information source
 $X^2 = 6.695; d.f. = 2; p = .03$

TABLE 147

Type Of Nutrition Information Source Used Most Often By Mothers Of
Preschool Children In Relation To Age Of The Children

Source Used	Children's Age (years)			
	Most Often	2	3 - 4	TOTAL
Professional	n	6	20	26
	%	9.1	11.0	10.7
Personal	n	40	78	118
	%	60.6	43.1	48.0
Media	n	20	81	101
	%	30.3	45.9	41.4
TOTAL	n	66	181	245 ¹
	%	100.0	100.0	
% OF TOTAL		26.7	73.3	100.0

¹ excludes 2 cases who did not report an information source
 $\chi^2 = 5.715; d.f. = 2; p = .05$

The type of information source used most often was significantly related to the lack of maternal concern about children's eating behaviour. ($X^2 = 8.035$; d.f. = 1; $p = .01$) (Table 148). Mothers who reported that they were not concerned about any aspect of their children's eating habits were more likely to use professional and personal nutrition information sources than mothers who were concerned about their preschoolers' eating behaviour.

The type of information source used most often was not significantly related to any of the maternal eating behaviour concerns expressed by the respondents.

Although hypotheses had not been formulated concerning the relationship between preventive dietary practices implemented by the mothers and the type of information sources used, analysis was conducted to determine whether respondents who used professional sources of information most often were more likely to implement preventive dietary practices, such as use of low sugar cereals, addition of sweetener to cereal, wholegrain breads, margarine, low-fat milk, and non-use of salt. In addition, the type of information source used most often was examined in relation to the use of vitamin/mineral supplements, the type of food treat offered most frequently, and the type of snack food offered most often.

The type of information source used most often was significantly related to the type of food offered most frequently as a food treat ($X^2 = 5.885$; d.f. = 2; $p = .05$) (Table 149). A higher proportion of mothers who gave their children nutritious food treats most often (16.7%) compared to non-nutritious treats (6.0%) used professional information sources more often.

TABLE 148

Type Of Information Source Used Most Often By Mothers Of Preschool
Children In Relation To The Absence Of Maternal Eating Behaviour
Concerns

Type Of Source	Concerned About Eating Behaviour			TOTAL
		Yes	No	
Professional	n	19	7	26
	%	12.5	76.5	10.7
Personal	n	62	55	117
	%	40.8	59.8	47.9
Media	n	71	30	101
	%	46.7	32.6	41.4
TOTAL	n	152	92	244 ¹
	%	100.0	100.0	
% OF TOTAL		62.3	37.7	100.0

¹ excludes 2 cases who did not report an information source

$\chi^2 = 8.035; d.f. = 2; p = .01$

TABLE 149

Type Of Nutrition Information Source Used Most Often By Mothers Of
Preschool Children In Relation To The Type Of Food Most Frequently Given
As A Treat

Source Used Most Often	Type Of Food Treat			
		Nutritious	Non-Nutritious	TOTAL
Professional	n	11	7	18
	%	16.7	6.0	9.8
Personal	n	28	62	90
	%	42.4	53.0	49.2
Media	n	27	48	75
	%	40.9	41.0	41.0
TOTAL	n	66	117	183 ¹
	%	100.0	100.0	
% OF TOTAL		36.1	63.9	100.0

¹ excludes 74 subjects who did not use food treats

$\chi^2 = 5.885; d.f. = 2; p = .05$

The type of bread served to preschool children was also significantly related ($X^2 = 9.154; d.f. = 2; p = .01$) to the type of information source used most often (Table 150). A higher proportion of mothers who served their children wholegrain breads used media sources most often (44.6%) than mothers who served white bread (34.2%). The type of information source used most often was not related to any of the other preventive dietary practices examined, or to maternal awareness of the relation of diet to health. Further, the type of information source used most often was not significantly related to supplement usage or to the type of snack food offered most often.

5.13.2.2 Type Of Nutrition Information Source Considered Most Helpful

Personal sources of information were perceived to be the most helpful sources of nutrition information by 48.8% of the mothers (Table 151). Eighty-nine respondents (36.2%) thought that media sources had been the most helpful to them. Only 15.0% of the mothers considered professional sources of nutrition information to have been the most helpful.

The type of information source perceived most helpful was significantly related ($X^2 = 5.943; d.f. = 2; p = .05$) to SES, contrary to the formulated hypothesis (Table 152). A higher proportion of lower SES mothers (21.4%) perceived professional sources of nutrition information as being the most helpful compared to higher SES respondents (11.2%). Mothers with higher SES scores were more likely to perceive personal sources of information as being most helpful. When this relationship was examined in the presence of employment status ($X^2 = 6.61; d.f. = 1; p = .03$), place of

TABLE 150

Type Of Nutrition Information Source Used Most Often By Mothers Of
Preschool Children In Relation To The Type Of Bread Served

Source Used Most Often		Type Of Bread		
		Wholegrain	White	TOTAL
Professional	n	11	15	26
	%	6.6	19.0	10.6
Personal	n	81	37	118
	%	48.8	46.8	48.2
Media	n	74	27	101
	%	44.6	34.2	41.2
TOTAL	n	166	79	245 ¹
	%	100.0	100.0	
% OF TOTAL		67.8	32.2	100.0

¹ excludes two cases who did not report a value

$\chi^2 = 9.154; d.f. = 2; p = .01$

TABLE 151

Type Of Nutrition Information Source Considered To Be Most Helpful By
Mothers Of Preschool Children

Information Source	N ¹	%
Professional	37	15.0
Personal	120	48.8
Media	89	36.2
TOTAL	246	100.0

residence ($X^2 = 8.66; d.f. = 1; p = .01$), the relationship between SES and the type of information source considered most helpful was still significant. However, when family size was controlled, the relationship was no longer significant.

In addition, the relationship between SES and the type of information source considered most helpful was no longer significant when examined in the presence of maternal age. However, there was an interaction between SES and maternal age which may be causing this effect, even though the interaction was not significant (Table 153). Of lower SES respondents, a higher proportion of older mothers considered health professionals most helpful. However, an equal proportion of both young and older higher SES mothers considered health professionals most helpful.

TABLE 152

Type Of Information Source Considered Most Helpful By Mothers Of
Preschool Children In Relation To SES

Type Of Source		SES		TOTAL
		Low	Higher	
Professional	n	18	18	36
	%	21.4	11.2	14.7
Personal	n	34	86	120
	%	40.5	53.4	49.0
Media	n	32	57	89
	%	38.1	35.4	36.3
TOTAL	n	84	161	245 ¹
	%	100.0	100.0	
% OF TOTAL		34.3	65.7	100.0

¹ excludes 2 subjects who did not report a source

$\chi^2 = 5.943; d.f. = 2; p = .05$

TABLE 153

Type Of Information Source Considered Most Helpful By Mothers Of
Preschool Children In Relation To SES And Maternal Age

Maternal Age	SES					
	LOW			HIGHER		
	Most Helpful Source ¹			Most Helpful Source ¹		
	1	2	3	1	2	3
Younger	20	19	11	27	35	9
Older	12	15	7	30	51	9

¹ Media= 1 Personal=2 Professional=3

Further, there was a significant interaction between SES, employment status, and the type of information source considered most helpful ($X^2 = 6.47; d.f. = 1; p = .04$) (Table 154) (Appendix M). Of mothers with a higher SES, respondents who were employed outside the home were more likely to consider personal sources of information most helpful (43/68) than non-employed respondents (43/93). In contrast, a different trend was evident for lower SES mothers. Respondents employed outside the home were less likely to consider personal sources of information most helpful (11/33) than nonemployed respondents (23/51).

TABLE 154

Type Of Information Source Considered Most Helpful By Mothers Of
Preschool Children In Relation To Maternal Employment Status and SES

Sample	SES	Employed	Type Of Information Source			TOTAL
			1 ¹	2 ²	3 ³	
1	Higher	Yes	16	43	9	68
2	Higher	No	41	43	9	93
3	Lower	Yes	15	11	7	33
4	Lower	No	17	23	11	51

1 Media Sources

2 Personal Sources

3 Professional Sources

$\chi^2 = 6.47; d.f. = 1; p = .04$

The type of information source perceived as being most helpful was not significantly related to the respondents' occupational status, place of residence, maternal age, employment status, family size, or education, or the age, gender, and birthrank of the child, supporting the hypothesis. However, when the relationship between place of residence and the type of information source considered most helpful was examined in the presence of SES, this relationship was significant ($X^2 = 7.46; d.f. = 1; p = .02$).

As would be expected, the type of information source perceived most helpful was significantly related ($X^2 = 184.080; d.f. = 4; p = .0001$) to the type of information source used most often (Table 155). It is possible that mothers tended to use most frequently the information sources they perceived as being most helpful.

Further analysis was conducted to determine if health professionals have been effective in alleviating maternal concern about children's eating behaviour as well as implementation of recommended dietary practices - including use of low sugar cereals, wholegrain breads, addition of a sweetener to cereal, use of salt, low-fat milk, margarine, vitamin/mineral supplements, non-nutritious food treats, and the type of snack food offered most often.

The type of information source considered most helpful was not significantly related to any of the eating behaviour concerns expressed by the mothers, or to maternal ratings of appetite and willingness to eat. However, the practice of adding a sweetener to prechool children's cereal was significantly related ($X^2 = 6.198; d.f. = 2; p = .04$) to the type of information source considered most helpful (Table 156). A higher proportion of mothers who did not add a sweetener to their children's cereal

TABLE 155

Type Of Information Sources Considered Most Helpful By Mothers Of
Preschool Children In Relation To The Type Of Information Source Used
Most Often

Most Helpful Source		Source Used Most Often			
		Professional	Personal	Media	TOTAL
Professional	n	22	2	2	26
	%	59.5	1.7	2.3	10.6
Personal	n	9	92	17	118
	%	24.3	76.7	19.3	48.2
Media	n	6	26	69	101
	%	16.2	21.7	78.4	41.2
TOTAL	n	37	120	88	245 ¹
	%	100.0	100.0	100.0	
% OF TOTAL		15.1	49.0	35.9	100.0

¹ excludes 2 cases who did not report an information source
X² =184.080;d.f.=4;p=.0001

(54.4%) considered personal information sources most helpful than than those who did add a sweetener (38.6%).

Further, the type of bread consumed by preschool children was also significantly related to the type of information source considered most helpful ($X^2 = 9.730; d.f. = 2; p = .007$) (Table 157). A higher proportion of mothers who served their children white bread (25.3%) considered professional sources of information to have been most helpful compared to mothers who served their children wholegrain breads (10.2%). The type of information source considered most helpful was not significantly related to salting habits, use of margarine, eggs, low sugar cereals, or the the use of supplements, non-nutritious treats or non-nutritious snacks.

5.13.2.3 Specific Sources Of Nutrition Information

Each information source reported by the respondents was considered in relation to the demographic variables examined to determine which channels of information would be most effective in reaching specific segments of the population of mothers of preschool children. The nutrition information source most frequently mentioned by the mothers of preschool children was pamphlets, reported by 43.7% of the respondents (Table 158). Other researchers have also reported that pamphlets are frequently utilized by mothers to obtain nutrition information (Rae and Neilson, 1980; Schwartz and Barr, 1977; Eppright et al. 1969). The use of pamphlets as a source of nutrition information was not significantly related to any of the demographic variables examined, suggesting that pamphlets were used by all segments of the mothers surveyed. Perhaps

TABLE 156

Type Of Information Source Considered Most Helpful By Mothers Of
Preschool Children In Relation To The Maternal Practice Of Sweetening
Children's Cereal

Type Of Source		Addition Of Sweetener		TOTAL
		Yes	No	
Professional	n	18	18	36
	%	12.1	20.5	15.2
Personal	n	34	81	115
	%	38.6	54.4	48.5
Media	n	36	50	86
	%	40.9	33.6	36.3
TOTAL	n	88	149	237
	%	100.0	100.0	
% OF TOTAL		37.1	62.9	100.0

$$\chi^2 = 6.198; d.f. = 2; p = .04$$

TABLE 157

Type Of Information Source Considered Most Helpful In Relation To The
Type Of Bread Served To Preschool Children

Type Of Source	Type Of Bread			
		Wholegrain	White	TOTAL
Professional	n	17	20	37
	%	10.2	25.3	15.0
Personal	n	85	35	120
	%	50.9	44.3	48.8
Media	n	65	24	89
	%	38.9	30.4	36.2
TOTAL	n	167	79	246 ¹
	%	100.0	100.0	
% OF TOTAL		67.9	32.1	100.0

¹ excludes one case who did not report a source

$\chi^2 = 9.730; d.f. = 2; p = .007$

other demographic variables not examined are affecting the use of pamphlets as an information source.

The popularity of the print media as sources of nutrition information was further emphasized by the frequency with which magazines, newspapers and books were reported by the mothers. Magazines were the third most frequently mentioned source of nutrition information, being reported by 39.7% of the sample. The results concur with the findings of several researchers who also found that women frequently obtain nutrition information from magazines (Eppright et al., 1969; Sullivan and Schwartz, 1981; New Brunswick Ministry of Health, 1981). The use of magazines was not related to the educational attainment of the mothers, contrary to the results of Young et al. (1956) who reported that more highly educated mothers more frequently utilized magazines compared to women with less education. The use of magazines as a source of nutrition information was not associated with any specific demographic variables. This suggests that magazines are widely read by mothers of preschool children, regardless of place of residence, SES, occupational status, maternal age, education, employment status, family size or the age, gender and birthrank of the child. However, as data were not collected on the type of magazines read, it is possible that different segments of the population of mothers of preschool children read different types of magazines.

Fifty-seven respondents (23.1%) reported having received information on nutrition via newspapers. Eppright et al. (1969) and Schwartz and Barr (1977) reported a higher percentage of mothers of young children surveyed mentioned newspapers as a source of information (48% and 46.2%, respectively).

TABLE 158

Sources Of Nutrition Information Used By Mothers Of Preschool Children

Information Source	N	% ¹
Pamphlets	108	43.7
Own Experience/Common Sense	107	43.4
Magazines	98	39.7
School/Education	68	27.5
Physician	66	26.7
Nurse/Public Health Nurse	64	25.9
Books	61	24.7
Friends/Relatives	58	23.5
Newspapers	57	23.1
Mothers	54	21.9
Prenatal Class	42	17.0
Canada's Food Guide	42	17.0
Television/Radio	31	12.5
Cookbooks	19	7.7
Home Economics Teacher	17	6.9
Nutritionist/Home Economist	12	4.9
Weight Control Class	11	4.5
Husband	3	1.2
Daycare Centre	3	1.2
Fitness Class	2	0.8
Health Food Store	2	0.8
Dentist	2	0.8
Church	2	0.8
Lectures/Displays	1	0.4
La Leche League	1	0.4
Cooking Class	1	0.4
No Sources Used	1	0.4

¹ totals to more than 100% due to multiple reponses

The use of newspapers as a source of nutrition information was significantly related to the age of the preschool children ($\chi^2=12.192$;d.f.=2;p=.002) (Table 159). A higher proportion of mothers with three (28.8%) and four (28.6%) year old children reported having received information via newspapers, compared to only 7.6% of mothers of two-year old children. It is possible that mothers of older preschoolers have more free time available in which to read newspapers.

The use of newspapers as a source of information was not related to the education level of the respondents. This finding does not concur with the results of Young et al. (1956) who reported that more highly educated homemakers tended to more frequently use newspapers to obtain nutrition information than less educated mothers. The use of newspapers to obtain nutrition information was also not related to the respondents' place of residence, SES, occupational status, maternal education, maternal age, employment status, family size, or the gender and birthrank of the preschool children.

Sixty-one respondents (24.7%) reported receiving nutrition information from books and paperbacks, and an additional 7.7% of respondents mentioned cookbooks. Eppright et al. (1969) found that 47% of mothers of preschool children reported receiving nutrition information from books. Schwartz and Barr (1977) also reported a higher percentage of women utilized books to obtain nutrition information, as 28% of the mothers of infants surveyed mentioned paperbacks and 12.6% listed books. However, the percentage of mothers using books to obtain nutrition information in the current study was higher than that found in the Nutrition Concepts Study (Rae and Neilson, 1981) in which it was found that only 10% of the 400 Prairie respondents surveyed used books.

TABLE 159

Maternal Use Of Newspapers As A Source Of Nutrition Information In
Relation To The Age Of Preschool Children

Use Of Newspapers		Age Of Child (years)			TOTAL
		2	3	4	
Yes	n	5	46	6	57
	%	7.6	28.8	28.6	23.1
No	n	61	114	15	190
	%	92.4	71.5	71.4	76.9
TOTAL	n	66	160	21	247
	%	100.0	100.0	100.0	
% OF TOTAL		26.7	64.8	8.5	100.0

$$X^2 = 12.192; d.f. = 2; p = .002$$

The use of books as a source of nutrition information was significantly related ($X^2 = 5.660; d.f. = 1; p = .05$) to the respondents' place of residence (Table 160). A higher proportion of urban mothers (38.6%) reported obtaining nutrition information from books compared to 22.3% of metropolitan mothers and 20.7% of rural women. This relationship was no longer significant when examined in the presence of SES, occupational status, maternal age, family size, employment status, or maternal education.

However, there was an interaction between the use of books to obtain nutrition information, place of residence and maternal education ($X^2 = 4.62; d.f. = 1; p = .03$) (Table 161) (Appendix N). Of metropolitan mothers, respondents with elementary and high school education were less likely to use books to obtain information on nutrition (10:59) than more highly educated women (17:35). In contrast, of non-metropolitan mothers, less educated respondents were more likely to obtain nutrition information from books (24:59) than women with university or college education (10:33).

The use of books as a nutrition information source was not related to the mothers' age, SES, education level, or occupational status, contrary to the findings of Rahn (1980) who found that urban women who mentioned books as a preferred information source tended to be young, well-educated, with a moderate socioeconomic status. The use of books as a source of nutrition information was also not related to family size, employment status, or the age, gender, and birthrank of the preschool children.

TABLE 160

Maternal Use Of Books As A Source Of Nutrition Information In Relation
To Place Of Residence

Use Of Books		Place Of Residence			TOTAL
		M ¹	U ²	R ³	
Yes	n	27	17	17	61
	%	22.3	38.6	20.7	24.7
No	n	94	27	65	186
	%	77.7	61.4	79.3	75.3
TOTAL	n	121	44	82	247
	%	100.0	100.0	100.0	
% OF TOTAL		49.0	17.8	33.2	100.0

¹ M=metropolitan

² U=urban

³ R=rural

$X^2 = 5.660; d.f. = 2; p = .05$

TABLE 161

Maternal Use Of Books To Obtain Nutrition Information In Relation To
Place Of Residence and Maternal Education

Sample	Residence ¹	Education ²	Use Of Books		TOTAL
			Yes	No	
1	M	E + H	10	59	69
2	M	C + U	17	35	52
3	U	E + H	13	14	27
4	U	C + U	4	13	17
5	R	E + H	11	45	56
6	R	C + U	6	20	26

¹ M=metropolitan U=urban R=rural

² E + H=elementary + high school

C + U=college + university

Canada's Food Guide was specifically mentioned by 17.0% of the mothers. Similar findings were reported by Rae and Neison (1981) who found that 13% of the 400 Prairie respondents surveyed reported having obtained nutrition information from Canada's Food Guide.

The use of Canada's Food Guide to obtain nutrition information was not related to the respondents' age, occupational status, place of residence, SES, education, employment status, or family size, or the age, gender and birthrank of the target preschool children.

Thirty-one mothers (12.5%) reported receiving nutrition information from television or radio. Similar results were reported by Rae and Neilson (1981) who found that 18% of the respondents surveyed mentioned television as an information source. A higher percentage of mothers surveyed by Eppright et al. (1969) listed television (34%) and radio (21%) as an information source. However, only 6% of the 93 mothers of preschool children surveyed by Metheny et al. (1962b) listed television or radio as a source of nutrition information.

The use of television and radio to obtain information on nutrition was significantly related to family size ($X^2 = 10.930; d.f. = 1; p = .00009$) (Table 162). A higher proportion of mothers of larger families (21.0%) reported having received nutrition information from television and radio than mothers with less than three children (6.8%). This relationship was still significant when examined in the presence of SES ($X^2 = 6.46; d.f. = 1; p = .01$), place of residence ($X^2 = 10.18; d.f. = 1; p = .001$), occupational status ($X^2 = 6.61; d.f. = 1; p = .01$), employment status ($X^2 = 9.07; d.f. = 1; p = .002$), maternal age ($X^2 = 8.59; d.f. = 1; p = .003$) and maternal education ($X^2 = 9.35; d.f. = 1; p = .002$).

TABLE 162

Maternal Use Of Television/Radio As A Source Of Nutrition Information In
Relation To Family Size

Use OF Television/Radio		Number Of Children		
		1 - 2	3 - 6	TOTAL
Yes	n	10	21	31
	%	6.8	21.0	12.5
No	n	137	79	215
	%	93.2	79.0	87.5
TOTAL	n	147	100	247
	%	100.0	100.0	
% OF TOTAL		59.5	40.5	100.0

$$X^2 = 10.930; d.f. = 1; p = .00009$$

The use of television and radio as an information source was also related to the birthrank of the preschool children ($X^2 = 10.930$; d.f.=1; $p = .00009$) (Table 163). A higher proportion of mothers of laterborn children (17.0%) reported receiving nutrition information from television and radio than mothers of firstborn children (4.6%).

The use of television and radio to obtain information on nutrition was not significantly related to SES, place of residence, occupational status, maternal age, education, employment status, or the age and gender of the preschool children.

The respondents also relied extensively on their own common sense and past experience when faced with dietary problems. Of the 247 mothers surveyed, 43.3% listed past experience/common sense as a source of nutrition information. The data is consistent with the research of Metheny et al. (1962b) who reported that the greatest effect on the dietary practices of 645 New York homemakers was their past education and experience. Schwartz and Barr (1977), who examined the nutrition information sources of mothers of infants also reported that past education and experience was the most frequently mentioned information source. While the current findings would seem to indicate that a lower percentage of mothers are relying on their own common sense and experience as a source of nutrition information than reported by Schwartz and Barr (1977) and Metheny et al. (1962b), past education was not included in this information category which may be affecting the results.

The age of the preschool children was significantly related to the respondents' reliance on their own common sense/experience as a source of nutrition information ($X^2 = 12.648$; d.f.=1; $p = .001$) (Table 164). A

TABLE 163

Maternal Use Of Television/Radio As A Source Of Nutrition Information In
Relation To The Birthrank Of Preschool Children

Use Of Television/Radio		Birthrank		TOTAL
		Firstborn	Laterborn	
Yes	n	4	27	31
	%	4.6	17.0	12.6
No	n	84	132	216
	%	95.4	83.0	87.4
TOTAL	n	88	159	247
	%	100.0	100.0	
% OF TOTAL		35.6	64.4	100.0

$$\chi^2 = 10.930; d.f. = 1; p = .00009$$

higher proportion of mothers of 2 year old children (60.6%) reported relying on their own common sense and experience than mothers of older preschool children.

There was no statistical relationship between maternal education and the use of common sense/past experience as a source of nutrition information, contrary to the findings of Young et al. (1956) who found that less educated women tended to rely more extensively on their own common sense than more highly educated homemakers. In addition, maternal reliance on past experience and common sense was not significantly related to maternal age, place of residence, occupational status, SES, family size, employment status, or the birthrank and gender of the preschool children.

Personal sources of nutrition information were also used extensively by the mothers, as 21.9% mentioned obtaining nutrition information from their mothers and 23.5% listed other relatives and friends. Schwartz and Barr (1977), who interviewed 150 Vancouver mothers of infants, found that 17.6% of the respondents surveyed listed their mothers as an information source. Several other researchers support the current finding that mothers of preschool children rely extensively on personal information sources such as their mothers and other friends and relatives (Young et al., 1956; Eppright et al., 1972).

Maternal use of their mothers to obtain information on nutrition was not related to the educational attainment of the respondents. This finding contradicts the results of Young et al. (1956) who reported that homemakers who utilized their mothers as an information source tended to have less education. Further, maternal reliance on their mothers as an

TABLE 164

Maternal Use Of Common Sense And Past Experience As A Source Of
Nutrition Information In Relation To The Age Of Preschool Children

Common Sense/ Experience		Age Of Child (years)			TOTAL
		2	3	4	
Yes	n	40	62	5	107
	%	60.6	38.8	23.8	43.4
No	n	26	98	16	140
	%	39.4	61.2	76.2	56.7
TOTAL	n	66	160	21	247
	%	100.0	100.0	100.0	
% OF TOTAL		26.7	64.8	8.5	100.0

$$\chi^2 = 12.648; d.f. = 2; p = .001$$

information source was not significantly related to SES, occupational status, maternal age, employment status, family size, place of residence, or the age, gender and birthrank of the preschool children. The use of friends and relatives to obtain nutrition information was also not related to any of the demographic variables examined.

Of the respondents surveyed, 27.5% reported obtaining nutrition information from the education system - either via their own past education or from information brought home by school-aged children. This result is similar to the findings of the Preschool Nutrition Clinic Survey (N.B. Ministry Of Health, 1981), in which it was reported that 22% of the parents received information via the education system. Sims et al. (1974) reported that 75% of the mothers of preschool children surveyed considered their past education, such as high school home economics courses, as their main source of nutrition information. Other surveys of Canadian adults have also shown that the education system is one of the most frequently mentioned nutrition information sources (Rae and Neilsen, 1980; Rahn, 1980).

The use of the education system to obtain nutrition information was significantly related to maternal education ($X^2 = 45.158; d.f. = 4; p = .0001$) (Table 165). Fifty-percent of university educated mothers and 42.1% of college-educated mothers reported receiving nutrition information from the education system, compared to only 10.5% of elementary and high school educated respondents. This finding reinforces the results of Young et al. (1956) who reported that more highly educated homemakers more frequently used formal education sources of nutrition information. This relationship was still significant when examined in the presence of occupational status ($X^2 = 30.67; d.f. = 1; p = .0001$), place of residence (X^2

=38.11;d.f.=1;p=.0001), family size ($X^2 = 37.80$;d.f.=1;p=.0001), maternal age ($X^2 = 34.99$;d.f.=1;p=.0001), and maternal employment status ($X^2 = 36.27$;d.f.=1;p=.0001).

Further, the SES of the respondents was significantly related to maternal use of the education system as a source of nutrition information ($X^2 = 16.635$;d.f.=1;p=.0001) (Table 166). Of higher SES mothers, 33.3% mentioned the education system as a source of nutrition information, compared to only 9.5% of lower SES respondents. This relationship was still significant when examined in the presence of place of residence ($X^2 = 11.3$;d.f.=1;p=.0008), family size ($X^2 = 14.6$;d.f.=1;p=.0001), maternal age ($X^2 = 12.95$;d.f.=1;p=.0003), and employment status ($X^2 = 14.68$;d.f.=1;p=.0001). However, when maternal education was controlled, the relationship was no longer significant.

Maternal use of the education system as a source of nutrition information was also significantly related ($X^2 = 9.791$;d.f.=2;p=.007) to maternal employment status (Table 167). A higher proportion of mothers who worked part-time (39.4%) reported receiving nutrition information from the education system compared to respondents who worked full-time (19.4%) or were non-employed (20.0%). This relationship was still significant when examined in the presence of place of residence ($X^2 = 4.72$;d.f.=1;p=.02), maternal age ($X^2 = 4.35$;d.f.=1;p=.03), and family size ($X^2 = 4.73$;d.f.=1;p=.02). However, when SES, education and occupational status were controlled, the relationship was no longer significant, suggesting that maternal employment status was not a unique predictor of the maternal practice of obtaining nutrition information via the education system.

TABLE 165

Maternal Use Of The Education System To Obtain Nutrition Information In
Relation To Maternal Education

Use Of Education System	Maternal Education			TOTAL	
	HS ¹	C ²	U ³		
Yes	n	16	8	33	62
	%	10.5	42.1	50.0	25.1
No	n	136	11	38	185
	%	89.5	57.9	50.0	74.9
TOTAL	n	152	19	76	247
	%	100.0	100.0	100.0	
% OF TOTAL		61.5	7.7	30.8	100.0

¹ HS=Elementary + High School

² C=College

³ U=University

$\chi^2 = 45.158; d.f. = 4; p = .0001$

TABLE 166

Maternal Use Of The Education System To Obtain Nutrition Information In
Relation To SES

Use Of Education System		SES		TOTAL
		Low	Higher	
Yes	n	8	54	62
	%	9.5	33.3	25.2
No	n	76	108	184
	%	90.5	66.7	74.8
TOTAL	n	84	162	246 ¹
	%	100.0	100.0	
% OF TOTAL		34.2	65.8	100.0

¹ excludes ones cases in which an SES value was not available

$\chi^2 = 16.635; d.f. = 1; p = .0001$

TABLE 167

Maternal Use Of The Education System As A Source Of Nutrition
Information In Relation To Maternal Employment Status

Use Of Education System		Employment Status			TOTAL
		Fulltime	Parttime	No ¹	
Yes	n	7	26	29	62
	%	19.4	39.4	20.0	25.1
No	n	29	40	116	185
	%	80.6	60.6	80.0	74.9
TOTAL	n	36	66	145	247
	%	100.0	100.0	100.0	
% OF TOTAL		14.6	26.7	58.7	100.0

¹ not employed outside the home

$\chi^2 = 9.791; d.f. = 2; p = .007$

In addition, the use of the education system as a source of nutrition information was significantly related to maternal age ($X^2 = 5.007$; d.f.=1; p=.02) (Table 168). A higher proportion of older mothers mentioned the education system as a source of nutrition information (31.2%) than mothers younger than thirty-one years of age (18.6%). This relationship was still significant when examined in the presence of occupational status ($X^2 = 5.10$; d.f.=1; p=.02), employment status ($X^2 = 4.78$; d.f.=1; p=.03), place of residence ($X^2 = 4.78$; d.f.=1; p=.02), and family size ($X^2 = 5.71$; d.f.=1; p=.01). However, the relationship was no longer significant when SES and maternal education were controlled, suggesting that maternal age is not a unique predictor of the maternal practice of obtaining nutrition information from the education system. This finding conflicts with the results of the Nutrition Concepts Study (Rae and Neilson, 1980), in which it was found that women less than twenty-five years of age were more likely to report receiving nutrition information from the schools than women fifty years of age and older. However, the distribution of ages in the current study was much narrower.

Seventeen percent of the respondents stated that they had received nutrition information from prenatal classes. The use of prenatal classes as a source of nutrition information was also significantly related to family size ($X^2 = 5.841$; d.f.=1; p=.01) (Table 169). A higher proportion of mothers with small families (21.8%) reported receiving nutrition information from prenatal classes compared to respondents with three or more children (10.0%). This relationship was still significant when examined in the presence of place of residence ($X^2 = 5.27$; d.f.=1; p=.02),

TABLE 168

Maternal Use Of The Education System As A Source Of Nutrition
Information In Relation To Maternal Age

Use Of Education System		Maternal Age		TOTAL
		20 - 30	31 - 43	
Yes	n	23	39	62
	%	18.6	31.2	25.1
No	n	99	86	185
	%	81.2	68.8	74.9
TOTAL	n	122	125	247
	%	100.0	100.0	
% OF TOTAL		49.4	50.6	100.0

$$\chi^2 = 5.007; d.f. = 1; p = .02$$

maternal age ($X^2 = 3.68; d.f.=1; p=.05$), employment status ($X^2 = 4.43; d.f.=1; p=.03$), maternal education ($X^2 = 6.07; d.f.=1; p=.01$) and occupational status ($X^2 = 3.78; d.f.=1; p=.05$).

When SES was controlled, the relationship between the use of prenatal classes as a source of information and family size was no longer significant. However, an interaction between SES and family size was confounding the results, causing the relationship to be no longer significant, even though the interaction was not significant at the 5% level (Table 170). A higher proportion of mothers with small families obtained nutrition information from prenatal classes, regardless of SES. However, while the same proportion of both higher and lower SES mothers of larger families obtained information from prenatal classes, a higher proportion of higher SES mothers with small families mentioned prenatal classes as a source of information.

Further, there was an interaction between maternal use of prenatal classes to obtain nutrition information, family size, and maternal employment status ($X^2 = 3.89; d.f.=1; p=.04$) (Table 171) (Appendix 0). Of mothers with large families, those employed outside the home were more likely to use prenatal classes to obtain nutrition information (6:29) than women who were non-employed (4:61). In contrast, of mothers with smaller families, women employed outside the home were less likely to obtain nutrition information from prenatal classes (12:55) than women not employed outside the home (20:60).

Further, the use of prenatal classes as an information source was significantly related to maternal age ($X^2 = 4.490; d.f.=1; p=.03$) (Table 172). Younger mothers were more likely to mention prenatal classes as a

TABLE 169

Maternal Use Of Prenatal Classes As A Source Of Nutrition Information In
Relation To Family Size

Use Of Prenatal Classes		Number Of Children		
		1 - 2	3 - 6	TOTAL
Yes	n	32	10	42
	%	21.8	10.0	17.0
No	n	115	90	205
	%	78.2	90.0	83.0
TOTAL	n	147	100	247
	%	100.0	100.0	
% OF TOTAL		59.5	40.5	100.0

$$\chi^2 = 5.841; d.f. = 1; p = .01$$

TABLE 170

Maternal Use Of Prenatal Classes As A Source Of Nutrition Information In
Relation To Family Size And SES

SES&S1	Family Size			
	SMALL		LARGER	
	Prenatal Classes		Prenatal Classes	
	Yes	No	Yes	No
Low	7	43	3	31
Higher	25	71	7	59

¹ excludes one case in which a SES value was not available

source of nutrition information ((22.1%) than mothers older than thirty years of age (12.0%). This relationship was still significant when examined in the presence of SES ($X^2 = 4.14; d.f. = 1; p = .04$), education ($X^2 = 4.93; d.f. = 1; p = .02$), occupational status ($X^2 = 3.85; d.f. = 1; p = .04$), and place of residence ($X^2 = 4.07; d.f. = 1; p = .04$). When family size was controlled the relationship was no longer significant, suggesting that family size was the main variable influencing use of prenatal classes as a source of nutrition information.

Further, when employment status was controlled, the relationship between maternal age and the use of prenatal classes as a source of in-

TABLE 171

Maternal Use Of Prenatal Classes To Obtain Nutrition Information In
Relation To Family Size And Employment Status

Sample	Family Size ¹	Employed	Prenatal Classes		
			Yes	No	Total
1	Large	Yes	6	29	35
2	Large	No	4	61	65
3	Small	Yes	12	55	67
4	Small	No	20	60	80

¹ Large= 3-6 children Small= 1-2 children

² Employed=Fulltime + Parttime

$\chi^2 = 3.89; d.f. = 1; p = .04$

TABLE 172

Maternal Use Of Prenatal Classes As A Source Of Nutrition Information In
Relation To Maternal Age

Use Of Prenatal Classes		Maternal Age (years)		
		20 - 30	31 - 43	TOTAL
Yes	n	27	15	42
	%	22.1	12.0	17.0
No	n	95	110	205
	%	77.9	88.0	83.0
TOTAL	n	122	125	247
	%	100.0	100.0	
% OF TOTAL		49.4	50.6	100.0

$$\chi^2 = 4.490; d.f. = 1; p = .03$$

formation was no longer significant. However, there was an interaction between maternal age, employment status and the use of prenatal classes as a source of nutrition information ($X^2 = 11.07; d.f. = 1; p = .0009$) (Table 173) (Appendix P). Of older mothers, women employed outside the home were more likely to obtain nutrition information from prenatal classes (12:43) than non-employed respondents (3:67). In contrast, of younger mothers, women employed outside the home were less likely to obtain information from prenatal classes (6:41) than respondents who did not work outside the home (21:54).

Further, the use of prenatal classes as a source of nutrition information was significantly related ($X^2 = 4.558; d.f. = 1; p = .03$) to the birthrank of the preschool children (Table 174). Mothers of firstborn children were more likely to mention receiving nutrition information from prenatal classes (23.9%) than mothers of laterborn children (13.2%). This finding is consistent with the research of Schwartz and Barr (1977) who found that women experiencing their first pregnancy were more likely to attend prenatal classes than mothers experiencing subsequent pregnancies.

Physicians and nurses (predominantly public health nurses), were the most frequently mentioned professional sources of nutrition information. Sixty-six mothers (26.7%) reported having received nutrition information from the physician, agreeing with the findings of several researchers that doctors are a preferred source of nutrition information for mothers with young children (Eppright et al., 1972; Clark, 1977; Schwartz and Barr, 1977; Rahn, 1980; Sullivan and Schwartz, 1981; Neilson and Rae, 1980). However, the results suggest a trend for mothers to

TABLE 173

Maternal Use of Prenatal Classes To Obtain Nutrition Information In
Relation To Maternal Age And Employment Status

Sample	Age ¹	Employed ²	Prenatal Classes		TOTAL
			Yes	No	
1	Older	Yes	12	43	55
2	Older	No	3	67	70
3	Younger	Yes	6	41	47
4	Younger	No	21	54	75

¹ Older= 31-43 Younger= 20-30

² Yes=Fulltime + Parttime

TABLE 174

Maternal Use Of Prenatal Classes As A Source Of Nutrition Information In
Relation To Birthrank

Use Of Prenatal Classes		Birthrank		TOTAL
		Firstborn	Laterborn	
Yes	n	21	21	42
	%	23.9	13.2	17.0
No	n	67	138	205
	%	76.1	86.8	83.0
TOTAL	n	88	159	247
	%	100.0	100.0	
% OF TOTAL		35.6	64.4	100.0

$$\chi^2 = 4.558; d.f. = 1; p = .03$$

rely less extensively on the physician as a source of nutrition information as a lower percentage of mothers utilized this source than previously reported by Eppright et al. (1972) (55%), Schwartz and Barr (1977) (62.2%), and Clark (1977) (46%).

The use of the physician as a source of nutrition information was significantly related to SES ($X^2 = 5.320$; d.f.=1; $p=.02$) (Table 175). A higher percentage of lower SES mothers (34.5%) reported receiving nutrition information from their physician than higher SES respondents (21.0%). The results are similar to the findings of Rahn (1980) who reported that women who mentioned the physician as a preferred source of nutrition information tended to be from a lower SES background. This relationship was still significant when examined in the presence of place of residence ($X^2 = 8.49$; d.f.=1; $p=.003$), employment status ($X^2 = 4.92$; d.f.=1; $p=.02$), maternal age ($X^2 = 5.34$; d.f.=1; $p=.02$), and family size ($X^2 = 5.77$; d.f.=1; $p=.01$).

In addition, there was a significant relationship ($X^2 = 5.873$; d.f.=2; $p=.05$) between the respondents' place of residence and the use of physicians as a source of nutrition information (Table 176). Mothers residing in metropolitan areas (32.2%) were more likely to mention the physician as a source of nutrition information than urban (25.0%) and rural (17.1) residing respondents. This relationship was still significant when examined in the presence of SES ($X^2 = 7.44$; d.f.=1; $p=.006$), occupational status ($X^2 = 6.22$; d.f.=1; $p=.01$), education ($X^2 = 5.60$; d.f.=1; $p=.01$), maternal age ($X^2 = 5.30$; d.f.=1; $p=.02$), family size ($X^2 = 3.64$; d.f.=1; $p=.05$), and employment status ($X^2 = 3.75$; d.f.=1; $p=.05$).

TABLE 175

Maternal Use Of The Physician As A Source Of Nutrition Information In
Relation To SES

Use Of Physician		SES		TOTAL
		Low	Higher	
Yes	n	29	34	63
	%	34.5	21.0	25.6
No	n	55	128	183
	%	65.5	79.0	74.4
TOTAL	n	84	162	246 ¹
	&	100.0	100.0	
% OF TOTAL		34.2	65.8	100.0

¹ excludes one case in which a SES value was not available

$\chi^2 = 5.320; d.f. = 1; p = .02$

TABLE 176

Maternal Use Of The Physician As A Source Of Nutrition Information In
Relation To Place Of Residence

Use Of Physician		Place Of Residence			TOTAL
		M ¹	U ²	R ³	
Yes	n	39	11	14	64
	%	32.2	25.0	17.1	25.9
No	n	82	33	68	183
	%	67.8	75.0	82.9	74.1
TOTAL	n	121	44	82	247
	%	100.0	100.0	100.0	
% OF TOTAL		49.0	17.8	33.2	100.0

¹ M=Metropolitan

² U=Urban

³ R=Rural

$\chi^2 = 5.873; d.f. = 2; p = .05$

Maternal age was not significantly related to the use of physicians as a source of nutrition information. This finding contradicts the results of Rahn (1980) who found that women who mentioned the physician as a preferred source of nutrition information tended to be young. However, Rae and Neilsen (1980), having surveyed a wider age range, reported the opposite results as they reported that women fifty years of age and older were more likely to utilize the physician as a source of nutrition information than younger women.

In addition, the educational level of the mothers was not significantly related to the use of the physician as a nutrition information source. Rahn (1980) reported that women who mentioned the physician as a preferred source of nutrition information tended to be moderately well-educated, having completed high school.

The use of the physician as a source of nutrition information was also not significantly related to occupational status, family size, employment status, or the age, gender, and birthrank of the preschool children.

Nurses were also frequently mentioned professional sources of nutrition information, reported by 25.9% of the mothers. The results concur with the findings of Rahn (1980) who also found that nurses were second only to physicians as the health professional most frequently contacted.

The use of nurses as a source of nutrition information was significantly related ($\chi^2 = 5.994; d.f.=1; p=.01$) to SES (Table 177). A higher proportion of lower SES mothers (35.7%) reported receiving nutrition information from nurses compared to higher SES respondents (21.0%). This

relationship was still significant when examined in the presence of place of residence ($X^2 = 7.34$;d.f.=1;p=.006), family size ($X^2 = 6.16$;d.f.=1;p=.01), maternal age ($X^2 = 6.71$;d.f.=1;p=.009), and employment status ($X^2 = 54.6$;d.f.=1;p=.01).

The use of nurses as a source of nutrition information was not significantly related to occupational status, place of residence, maternal age, maternal education, family size, employment status, or to the age, gender and birthrank of the preschool children.

Seventeen respondents (6.9%) reported receiving nutrition information from a home economics teacher. Sims et al. (1976) reported that 75% of the mothers of preschool children surveyed indicated that their main source of nutrition information had been high school home economics courses.

There was a significant relationship ($X^2 = 4.212$;d.f.=1;p=.04) between maternal employment status and the use of home economics teachers as a source of nutrition information (Table 178). Mothers who worked outside the home were less likely to report receiving nutrition information from home economics teachers (2.9%) than women who were not employed outside the home (9.7%). This relationship was no longer significant when SES, education, occupational status, place of residence, family size, and maternal age were controlled, suggesting that employment status was not an important predictor of maternal use of home economics teachers to obtain nutrition information.

Maternal use of home economics teachers as a source of nutrition information was also significantly related to occupational status ($X^2 = 4.403$;d.f.=1;p=.03) (Table 179). A higher proportion of mothers who

TABLE 177

Maternal Use Of Nurses/Public Health Nurses As A Source Of Nutrition
Information In Relation To SES

Use Of Nurses		SES		TOTAL
		Low	Higher	
Yes	n	30	34	64
	%	35.7	21.0	26.0
No	n	54	128	182
	%	64.3	79.0	74.0
TOTAL	n	84	162	246 ¹
	%	100.0	100.0	
% OF TOTAL		34.2	65.8	100.0

¹ excludes one case in which a SES value was not available

$\chi^2 = 5.994; d.f. = 1; p = .01$)

TABLE 178

Maternal Use Of Home Economics Teachers As A Source Of Nutrition
Information In Relation To Employment Status

Use Of Home Economics Teacher		Employed		TOTAL
		Yes	No	
Yes	n	3	14	17
	%	2.9	9.7	6.9
No	n	99	131	230
	%	97.1	90.3	93.1
TOTAL	n	102	145	247
	%	100.0	100.0	
% OF TOTAL		41.3	58.7	100.0

$$\chi^2 = 4.212; d.f. = 1; p = .04$$

reported home economics teachers as an information source had high occupation scores (9.4%) than mothers who did not use home economics teachers (2.3%). This relationship was no longer significant when maternal education, place of residence, maternal age, family size and employment status were controlled.

The use of home economics teachers as a source of nutrition information was not related to SES, maternal age, maternal education, family size, place of residence, or to the age, gender and birthrank of the preschool children,

Only twelve respondents - less than 5% of the mothers surveyed - reported receiving nutrition information from nutritionists, dietitians, or home economists. Other researchers have reported nutritionists to have been more extensively utilized as sources of nutrition information (Metheny et al., 1962b; Eppright et al., 1972; Schwartz and Barr, 1977). However, in the current study, the respondents verbally listed the sources from which they obtained nutrition information, and therefore may have been less encouraged to give the most socially acceptable answer than they would have been in a personal interview or a written questionnaire. Alternatively, the smaller percentage of mothers who reported receiving nutrition information from nutritionists may be because there are fewer regional nutritionists in Manitoba.

The use of nutritionists as a source of nutrition information was significantly related to the respondents' place of residence ($\chi^2 = 5.954; d.f. = 1; p = .01$) (Table 180). A higher proportion of metropolitan mothers (8.3%) reported receiving nutrition information from nutritionists compared to non-metropolitan residing respondents (1.6%). This re-

TABLE 179

Maternal Use Of Home Economics Teachers As A Source Of Nutrition
Information In Relation To Occupational Status

Home Economics Teacher	Occupational Status			TOTAL
		Low	High	
Yes	n	2	15	17
	%	2.3	9.4	6.9
No	n	85	145	230
	%	97.7	90.6	93.1
TOTAL	n	87	160	247
	%	100.0	100.0	
% OF TOTAL		35.2	64.8	100.0 ¹

¹ excludes one case in which a value was not available

$\chi^2 = 4.403; d.f. = 1; p = .03$

lationship was still significant when examined in the presence of family size ($X^2 = 4.87$; d.f.=1; p=.02), maternal age ($X^2 = 4.68$; d.f.=1; p=.03) and employment status ($X^2 = 4.02$; d.f.=1; p=.04). However, when education and occupational status were controlled for, the relationship was no longer significant.

The use of nutritionists as sources of nutrition information was also significantly related ($X^2 = 3.730$; d.f.=1; p=.05) to SES (Table 181). A higher proportion of higher SES mothers (6.8%) reported receiving nutrition information from nutritionists than lower SES respondents (1.2%). This relationship was still significant when examined in the presence of family size ($X^2 = 6.16$; d.f.=1; p=.01), maternal age ($X^2 = 6.71$; d.f.=1; p=.009), and place of residence ($X^2 = 7.34$; d.f.=1; p=.006). However, when employment status was controlled this relationship was no longer significant.

Further, the use of nutritionists as a source of nutrition information was significantly related to occupational status ($X^2 = 3.933$; d.f.=1; p=.04) (Table 182). A higher proportion of respondents with higher occupational status reported using nutritionists as sources of nutrition information (6.9%) than mothers with lower occupation status (1.2%). This relationship was no longer significant when place of residence, SES, family size, education, and maternal age were controlled for.

In addition, the use of nutritionists as an information source was significantly related ($X^2 = 7.114$; d.f.=1; p=.007) to maternal education (Table 183). Mothers with a higher educational background (9.5%) were more likely to report receiving nutrition information from nutritionists than women with elementary or high school education (2.0%). This rela-

TABLE 180

Maternal Use Of Nutritionists As A Source Of Nutrition Information In
Relation To Place Of Residence

Use Of Nutritionists		Place Of Residence		TOTAL
		M ¹	U + R ²	
Yes	n	10	2	12
	%	8.3	1.6	4.9
No	n	111	124	235
	%	9.17	98.4	95.1
TOTAL	n	121	126	247
	%	100.0	100.0	
% OF TOTAL		49.0	51.0	100.0

¹Metropolitan

² Non-Metropolitan

$\chi^2 = 5.954; d.f. = 1; p = .01$

TABLE 181

Maternal Use Of Nutritionists As A Source Of Nutrition Information In
Relation To SES

Use Of Nutritionists		SES		TOTAL
		Low	Higher	
Yes	n	1	11	12
	%	1.2	6.8	4.9
No	n	83	151	234
	%	98.8	93.2	95.1
TOTAL	n	84	162	246 ¹
	%	100.0	100.0	
% OF TOTAL		34.2	65.8	100.0

¹ excludes one case in which a SES value was not available

$X^2 = 3.730; d.f. = 1; p = .05$

TABLE 182

Maternal Use Of Nutritionists As A Source Of Nutrition Information In
Relation To Occupational Status

Use Of Nutritionists		Occupational Status		
		Low	Higher	TOTAL
Yes	n	1	11	12
	%	1.2	6.9	4.9
No	n	86	149	235
	%	98.8	93.1	95.1
TOTAL	n	87	160	247
	%	100.0	100.0	
% OF TOTAL		64.8	35.2	100.0

$$X^2 = 3.997; d.f. = 1; p = .04$$

tionship was still significant when family size ($X^2 = 5.61; d.f. = 1; p = .01$), occupational status ($X^2 = 5.42; d.f. = 1; p = .01$), maternal age ($X^2 = 5.82; d.f. = 1; p = .01$) and employment status ($X^2 = 4.97; d.f. = 1; p = .02$) were controlled for. However, the relationship was no longer significant when examined in the presence of place of residence.

In summary, the results indicate that a wide variety of information sources were used by the mothers, suggesting that nutrition educators should use as many information sources as possible. Mothers living in metropolitan areas tended to use a greater number of information sources than urban and rural residing mothers. Further, mothers who used more than four sources of information were more likely to serve their children wholegrain breads.

Media sources were used extensively by the mothers. Pamphlets and magazines particularly appear to be an excellent way through which nutrition information could be widely disseminated to mothers of preschool children. Information regarding preschool nutrition should be included in the literature provided to new mothers while in the hospital, as many of the respondents stated that they referred back to pamphlets they had received on that occasion. Mothers of larger families were more likely to receive information via television or radio compared to mothers with few children.

Personal sources of information were also frequently utilized by the mothers. Many respondents reported receiving nutrition information from friends, relatives and other family members. While the mothers relied extensively on their own common sense and past experience, the education system also appears to be an effective way of communicating nu-

TABLE 183

Maternal Use Of Nutritionists As A Source Of Nutrition Information In
Relation To Maternal Education

Use Of Nutritionists		Maternal Education		
		HS ¹	U ²	TOTAL
Yes	n	3	9	12
	%	2.0	9.5	4.9
No	n	149	86	235
	%	98.0	90.5	95.1
TOTAL	n	152	95	247
	%	100.0	100.0	
% OF TOTAL		61.5	38.5	100.0

¹ High School + Elementary

² College + University

$\chi^2 = 7.114; d.f. = 1; p = .007$

trition information to mothers of young children, particularly to more highly educated women. In addition to the mothers' own past education, many mothers reported reading information brought home by their school-aged children. Information was also frequently obtained from prenatal classes, especially with younger women. Literature on preschool nutrition should be included in the literature provided to mothers at prenatal classes.

Health professionals were used most often and considered most helpful by mothers with a lower SES. Encouragingly, mothers who used professional sources of information most often were less likely to be concerned about their children's eating behaviour, suggesting that health professionals are being effective in alleviating parental concern about the adequacy of their child's diet. In addition, mothers who considered professional sources to have been the most helpful were less likely to add a sweetener to their child's cereal.

Physicians and nurses were the health professionals most frequently contacted. Several studies have indicated that the current nutrition knowledge of physicians and public health nurses may be inadequate (Schwartz, 1976; Hedley et al., 1981; Krause and Fox, 1977; Phillips, 1974; Podell et al., 1975; Robichon et al., 1981). Nutritionists should continue to stress the importance of nutrition education and preventive health during inservice training for physicians and nurses, since mothers of preschool children rely extensively on health professionals, other than nutritionists, to obtain nutrition information.

Chapter VI
SUMMARY AND CONCLUSIONS

6.1 SUMMARY

Data from 247 questionnaires completed by mothers of preschool children two to four years of age, throughout the province of Manitoba, were analyzed to determine the eating behaviour concerns, dietary practices and sources of nutrition information. Demographic data were collected to determine their influence on mothers' eating behaviour concerns and dietary practices. As the 247 mothers were a random sample from all mothers in Manitoba, with minor exceptions, inferences can legitimately be made about the dietary practices of preschool children in Manitoba.

The respondents were evenly divided between residing in metropolitan and non-metropolitan areas. The mean age of the mothers was 30.8 years. The sample was well-educated with 30.8% of the mothers having some university education. The majority of the mothers were not employed outside the home. Family size ranged from one to six children, with the mean number of children in each family being 2.4. The majority of the target preschool children studied were three years of age, with 53.0% being female. Many of the demographic variables were interrelated, with place of residence being significantly related to maternal education, SES, maternal age, and family size. Few of the children were on special diets.

The eating behaviour concerns expressed by the mothers of preschool children were the same concerns reported by American mothers over a decade ago, although the proportion of mothers expressing these concerns was somewhat lower. Maternal concerns focused primarily on limited consumption of food in general, and meat, milk, and vegetables in particular; fussy eating habits; and the consumption of too many sweets. Further, 24.7% of mothers perceived their children to have a "fair" appetite, and 15.5% rated their preschooler to be willing to eat only "sometimes". Maternal rating of appetite and willingness to eat were significantly related and may be measuring a closely related concept. Further, maternal rating of appetite and willingness to eat were associated with several eating behaviour concerns. Mothers residing in non-metropolitan areas tended to be concerned about excess sugar consumption and women not employed outside the home were concerned about dawdling. Many of the eating behaviour concerns were interrelated as mothers concerned about the total amount of food consumed also tended to be concerned about fussy eating habits, meat intake, and limited vegetable intake.

The results suggest that mothers of preschool children are aware of the relation of diet to health, and that most mothers are willing to make changes in the diets of their children for health reasons. Mothers reported attempting to change the eating habits of their preschoolers, specifically trying to limit the consumption of sugar, salt, cholesterol, and saturated fat. Mothers residing in metropolitan areas tended to attempt to limit the salt intake of their child while mothers residing in urban and rural areas were more likely to attempt limiting sugar in-

take. Eighty-four mothers stated that they tried to have their children consume a sensible, balanced diet. Most mothers served their children wholegrain breads (68%), low-sugar cereals (90%), low-fat milk (55.5%), and margarine (75.2%). However, other factors besides health-promotional/disease prevention concerns may influence the implementation of these recommended practices, such as cost and taste.

Seventy-five percent of mothers used food "treats" for non-nutritive purposes, particularly mothers residing in non-metropolitan areas. High sugar foods were used as rewards, pacifiers, and as a means of encouraging preschool children to eat. A higher proportion of mothers residing in metropolitan areas and mothers concerned about limited vegetable intake and fussy eating habits used treats as rewards. In contrast, a higher proportion of mothers residing in non-metropolitan areas and mothers concerned about excess sugar consumption used treats as pacifiers. Sixty-eight percent of the food treats offered most frequently to children were classified as nutritionally or dentally unacceptable. The majority of the foods offered as between-meal snacks (86.9%) however, were snacks recommended by nutritionists and dentists.

Sixty-four percent of the children received supplements, usually a multivitamin or a multivitamin with iron preparation. Younger mothers were more likely to supplement their child's diet than women older than thirty years of age, as well as mothers with small families. Forty-nine percent of children receiving supplements were given a supplement everyday throughout the year and 42.8% were given a supplement everyday in the winter. Of the mothers who gave their children supplements, 18.2% did so because their physician recommended this practice and 17.6% did so to prevent colds.

A variety of nutrition information sources was used by the mothers of preschool children. Mothers residing in the city tended to use a greater number of information sources than urban and rural mothers. Media sources of information were frequently utilized, with pamphlets (43.9%) and magazines (39.7%) being particularly popular. Mothers also relied extensively on their own common sense and past experience (43.3%). The education system was an important resource, especially for more highly educated mothers. Physicians (26.7%) and nurses (25.9%) were the most frequently contacted health professionals. Women with a lower SES were more likely to use health professionals most often to obtain nutrition information than mothers with a higher SES.

6.2 LIMITATIONS

Several limitations were associated with the study. Firstly, while the initial sample was randomly selected, only 49.7% of the subjects were successfully contacted, although on checking, the nonresponse bias appears small. Secondly, many of the demographic variables examined were interrelated, thereby confounding many of the relationships investigated. With the statistical methods used, it was not always possible to examine the effects of specific demographic variables in multiway classifications due to the limited number of observations in some classes. However, the analysis did permit a more in depth examination of the results than traditionally accomplished with chi-square analysis.

6.3 CONCLUSIONS

Nutritionists have not been totally effective in remedying the old eating behaviour concerns of parents documented by Beal (1957), Eppright et al. (1969) and Metheny et al. (1962a). Maternal concerns continue to focus on an inadequate intake of food rather than excess food consumption. Possibly as a consequence of maternal concerns about inadequate intake, mothers also continue to perceive their preschoolers' to have poor appetites. Therefore, nutrition educators must search for new approaches to education to alleviate parents' overconcern about their preschoolers' food intake and subsequent inappropriate actions. Educators should focus on helping parents to more accurately assess their child's appetite and food intake as several eating behaviour concerns were associated with the amount of food consumed. Having parents record their child's food intake for a day or two could be useful when instructing parents on the amount of food a preschool child can realistically be expected to consume. This approach may be effective in alleviating several parental concerns about their children's eating behaviour, as many of the concerns were interrelated.

The majority of mothers used non-nutritious food as treats, primarily as rewards and pacifiers. Characteristics associated with the child such as gender and age appear to be influencing the implementation of this practice. Educating parents about the possible lifelong effects of such non-nutritive uses of food may help to decrease the incidence of this prevalent practice. Further, alleviating parental concerns about the adequacy of their child's diet may also have a beneficial effect on maternal non-nutritive uses of food, as mothers who were not concerned

about any aspects of their preschooler's eating behaviour were less likely to use food as a treat.

Encouragingly, the majority of snacks given most frequently to children were nutritionally and dentally acceptable. Mothers who were concerned about their child's meat intake were more likely to serve non-nutritious snacks, emphasizing the importance of alleviating parents' eating behaviour concerns. However, in the absence of further data validating maternal reports of the foods consumed most frequently as snacks, there is continued need to guide parents in making appropriate snack selections.

Nutrition educators should also focus on the role of supplements in the diet of preschool children as nutritionists have been ineffective in discouraging vitamin/mineral use. The majority of parents - particularly younger mothers - continue to supplement the diets of their children, many for unjustified reasons.

While only a small percentage of mothers expressed diet-related disease concerns, the majority of mothers were aware of the relation of diet to health. However, nutrition education directed to increasing awareness of the relation of diet to cardiovascular disease, obesity, and dental caries is necessary. Clarification of the role of cholesterol in the normal and therapeutic diet is also required. In addition, it is encouraging that many mothers were implementing dietary practices in agreement with the "Nutrition Recommendations For Canadians", including use of wholegrain breads, low-sugar cereals, low-fat milk, and non-use of salt.

Nutrition educators should use as many information sources as possible to reach mothers of preschool children, particularly the most frequently utilized channels such as pamphlets, magazines, the education system, physicians, and public health nurses.

The results have implications for nutrition education as the study identifies specific information sources which could be effective in reaching mothers in need of further education. Magazines and pamphlets would be an excellent way to transmit information on the importance of establishing weight maintaining practices with preschool children, and the use of polyunsaturated tablespreads, as they reach all segments of the population of mothers of preschool children in Manitoba. Non-metropolitan residing mothers would benefit from education on non-nutritive uses of food, and the health benefits of wholegrain breads and salt restriction, and could be reached via books, magazines, and pamphlets. Further, as women with lower SES could benefit from information on the value of wholegrain breads, this segment of the target group could be reached via physicians and nurses. As mothers residing in metropolitan areas also used health professionals to obtain nutrition information, physicians, nurses, and nutritionists should continue to stress the importance of limiting children's consumption of high sugar foods. In addition, prenatal classes could provide an effective way of decreasing the maternal practice of supplementing the diets of preschool children for non-valid reasons, as women less than thirty-one years of age tended to attend prenatal classes.

By using the most effective channels of information, accurate, consistent information on dietary practices appropriate with preschool

children could be provided to parents, possibly helping to alleviate maternal concerns about preschool children's eating behaviour and subsequent inappropriate practices.

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Appendix A

NUTRITIONAL AND DENTAL HEALTH QUALITY OF SNACK FOODS

NUTRITIONAL AND DENTAL QUALITY OF SNACK FOODS^a

NUTRITIONAL AND DENTAL
HEALTH QUALITY OF SNACK FOODS

TYPE OF SNACK FOOD

Nutritionally and Dentally
POOR

candy, gum, chocolates,
popsicles, pastries,
cookies, cakes

Nutritionally ACCEPTABLE but
Dentally POOR

ice cream, raisins,
milk puddings, frozen
yogurt, chocolate milk,
milk shakes

Nutritionally POOR but
Dentally ACCEPTABLE

sugarless gum, potato
chips, popcorn,
corn chips, cheezies

Nutritionally and Dentally
ACCEPTABLE

peanuts, sunflower
seeds, fruit,
vegetables, sandwiches,
eggs, milk, cheese,
meat, bread, cracker

^a adopted from Ontario Ministry of Health, 1975.

Appendix B
QUESTIONNAIRE

PRESCHOOL FEEDING SURVEY

Department of Foods and Nutrition

University of Manitoba

CODE: _____

Interviewer: _____

Person-To-Contact: Area Code _____ Phone _____

Name Mother: _____

Instructions To Interviewers:

Make a total of 4 telephone calls in an attempt to reach each person. Call 2 different days at 2 different times. Let the phone ring 8 times.

	DATE	TIME
1st call (daytime)	_____	_____
1st call (evening)	_____	_____
2nd call (daytime)	_____	_____
2nd call (evening)	_____	_____

CODE: _____

Maternal Age _____		Card 1
		____(5)
Sex of Child M F		____(6)
Geographic Location	Metropolitan	
	Urban	
	Rural	____(7)

.

"Hello(NAME). I'm calling from the University of Manitoba about the Preschool Feeding Survey. Did you receive our letter explaining the survey? (If NO, explain)

Are you willing to participate? ___Y ___N

The interview will take about 10 minutes. Will you answer our questions now, or may I call you back at a more convenient time?

CALLBACK _____

What is the name of your preschool child? _____

Are you the person primarily responsible for feeding (NAME)?

___Y ___Usually ___ N

(If NO - ask to speak to the person who is responsible)

Now, to get on with the questionnaire - If there are any particular questions you do not wish to answer, please tell me so.

The first part of the survey has a few questions about (NAME)'s EATING HABITS.

1. Would you say that (NAME)'s appetite is "Very Good", "Good", "Fair" or "Poor"?

- 1. Very Good
 - 2. Good
 - 3. Fair
 - 4. Poor
- ____(9)

2. Is (NAME) presently on a special diet?

- 1. Yes/Has been recently
 - 2. No → #5
- ____(10)



3. What type of diet is it?

- 1. weight-reducing
 - 2. heart disease
 - 3. diabetic
 - 4. low blood sugar
 - 5. allergies
 - 6. hyperactivity - Feingold
 - 7. vegetarianism
 - 8. other _____
- ____(11)

4. Was this diet given to you by a doctor or a dietitian, or was it your idea?

- 1. Doctor/Dietitian
 - 2. Self-Initiated
 - 3. Other _____
- ____(12)

5. Are there any foods your child doesn't eat because of your religious or ethnic background?

1. Yes/Sometimes _____ 2. No _____(13)

↓
What Foods? _____(14)

6. Is there anything about (NAME)'s food or eating habits that CONCERNS you? ...Is there anything else about his/her diet that you've been concerned about?

___ no concerns _____(15)

___ fussy eater/limited variety of foods _____(16)

___ reluctant to eat/dawdles at mealtime _____(17)

___ amount food 1. too much
2. too little _____(18)

___ too many sweets/desserts _____(19)

___ too few vegetables # servings _____(20)

___ too few fruits # servings _____(21)

___ meat intake 1. too much
2. too little
servings/day _____(22)

___ milk intake 1. too much
2. too little
cups/day _____(23)

___ obesity/weight _____(24)

___ fat intake/cholesterol _____(25)

___ salt intake _____(26)

___ iron intake/anemia _____(27)

___ food additives _____(28)

___ other _____(29)

7. How would you rate (NAME)'s willingness to eat - would you say he/she is willing to eat "All of the time", "Most of the time", "Sometimes", or "Rarely"?

- 1. Rarely
 - 2. Sometimes
 - 3. Most of the time
 - 4. Always
- ↓
#9
- ___(30)

8. What do you do or say when he/she does not want to eat? ... Anything else?

- ___ don't push food/ignore ___(31)
- ___ take food away ___(32)
- ___ verbally encourage/coax ___(33)
- ___ substitute liked foods ___(34)
- ___ offer non-food reward (tv) ___(35)
- ___ offer food reward (dessert) ___(36)
- ___ place food in mouth ___(37)
- ___ other _____ ___(38)

9. If (NAME) did not wish to eat, what do you think you would do or say? ... Anything else?

- ___ don't know ___(39)
- ___ don't push food/ignore ___(40)
- ___ take food away ___(41)
- ___ verbally encourage/coax ___(42)
- ___ substitute liked food ___(43)
- ___ offer non-food reward (tv) ___(44)
- ___ offer food reward (dessert) ___(45)
- ___ place food in mouth ___(46)
- ___ other _____ ___(47)

10. Do you give (NAME) food as a treat? - by food I'm referring to anything that is edible.

1. Yes/Sometimes 2. No #13 ___(48)

11. For what reason would he/she get a food treat? ...
Any other reason or occasion?

illness ___(49)
special occasion (BD) ___(50)
reward (good behavior/eating) ___(51)
to ensure good mood (shopping) ___(52)
when relatives visit ___(53)
other _____ ___(54)

12. Which food or drink does (NAME) get most often as a treat?

specify _____ ___(55)

13. Do your relatives or other friends give (NAME) food as a treat?

1. Yes/Sometimes

2. No

____(56)

14. How do you feel about this?

1. Concerned - try to limit

2. A bit concerned - but don't like to say anything

3. Don't mind

4. Other _____

____(57)

15. What type of bread does (NAME) eat?

1. whole grain

2. white + whole grain

3. white

4. neither

____(58)

16. Why do you serve whole grain bread?

1. healthier

2. taste

3. more roughage (fibre)

4. don't know

5. other _____

____(59)

17. Does (NAME) eat between family mealtimes?

1. Yes

2. No

____(60)

18. Which food or drink does he/she eat most often as a snack?

specify _____

____(61)

19. Does (NAME) eat cereal - either at breakfast or as a snack?

1. Yes/Sometimes

2. No

____(62)

#22

20. What type of cereal does he/she eat most often?

specify _____

____(63)

21. Do you - or (NAME) - add anything to the cereal?

1. no

2. sugar/brown sugar

3. honey/syrup

4. fruit

5. milk

6. other _____

____(64)

22. What type of milk does (NAME) drink?

1. skim 2. 2% 3. whole 4. chocolate 5. no milk ___(65)

23. Why do you serve that type of milk?

1. cost
2. taste/less rich
3. lower in calories ___(66)
4. allergies
5. lower in fat
6. other _____

24. How many eggs does (NAME) eat each week?

1. none
2. $\frac{1}{2}$ - 2
3. $2\frac{1}{2}$ - 4 ___(67)
4. $4\frac{1}{2}$ - 6
5. whites only #___
6. yolks only #___

25. Do you try to limit the number of eggs he/she eats?

1. Yes/Sometimes 2. No 3. Child won't eat ___(68)

26. Why?

1. family history of heart disease
2. special diet
3. eggs high in cholesterol ___(69)
4. too many eggs unhealthy
5. allergies
6. other _____

27. Do you generally put butter or margarine on (NAME)'s food?

1. margarine 2. margarine + butter 3. butter 4. neither

____(69)

28. Why do you use margarine?

1. special diet for CHD
2. lower in cholesterol
3. lower in calories
4. higher in PUFA, linoleic acid
5. cost
6. taste
7. easier to spread
8. healthier
9. other _____

____(70)

29. Do you add salt to (NAME)'s food when cooking, at the table, or in both cases?

1. don't use salt 2. table only 3. cooking only 4. both cases

____(71)

#31

30. Is there a reason why you don't use salt?

- while cooking?
- at the table?

1. child doesn't like taste
2. not healthy or needed
3. related to heart disease
4. salt-restricted diet
5. other _____

____(72)

31. Do you give (NAME) a vitamin or mineral supplement? _____(73)

1. Yes/Sometimes 2. No #35

32. What type of supplement does he/she get?

BRAND NAME _____

- 1. multivitamin
- 2. multivitamin + iron
- 3. iron only _____(74)
- 4. vitamin C only
- 5. calcium _____(75)
- 6. vitamin D
- 7. don't know/remember
- 8. other _____

33. How often does (NAME) get a supplement?

- 1. once a day
- 2. few times a week
- 3. once a week _____(76)
- 4. occasionally - few times/month
- 5. winter-time only
- 6. illness - when needs it
- 7. other _____

34. Why do you give him/her a supplement?

- 1. recommended by Dr/Nutritionist
- 2. fussy eater - needs it
- 3. for extra insurance _____(77)
- 4. suggested by family friend/relative
- 5. don't know
- 6. other _____

35. Do you think that (NAME) is overweight, underweight, or at his/her proper weight?

- 1. proper weight #36
 - 2. overweight #39
 - 3. underweight #42
 - 4. don't know #36
- ____(78)

PROPER WEIGHT

36. Do you do anything to help him/her stay at his/her proper weight?

- 1. Yes/Sometimes
 - 2. No
- ____(79)

37. What do you do? ... Anything else?

- use low-cal cooking methods
 - limit snacks
 - limit desserts/high sugar foods
 - limit fatty foods
 - keep physically active
 - other _____
- Card 2
____(5)
____(6)
____(7)
____(8)
____(9)
____(10)

38. If (NAME)'s weight became a problem, what do you think you would do? ... Anything else?

- see a Dr/Nutritionist
 - try a "special" diet
 - decrease total amount of food
 - decrease snacks
 - decrease desserts/high sugar foods
 - increase physical activity
 - don't know
 - other _____
- ____(11)
____(12)
____(13)
____(14)
____(15)
____(16)
____(17)
____(18)

OVERWEIGHT

39. Is this your opinion or someone else's?

- 1. Mother's own opinion
- 2. Husband's opinion
- 3. Friends/relatives _____(19)
- 4. Dr/Nurse's opinion
- 5. Nutritionist's opinion
- 6. Day Care Teacher
- 7. Other _____

40 . Have you tried to correct this problem?

- 1. Yes/Sometimes
- 2. No _____(20)



41. What have you done? ... Anything else?

- ____use low-cal cooking methods _____(21)
- ____decrease serving sizes/total amount _____(22)
- ____limit snacks _____(23)
- ____limit desserts/high sugar foods _____(24)
- ____limit fatty foods (chips) _____(25)
- ____tried a "special" diet _____(26)
- ____saw a Dr/Nutritionist for diet _____(27)
- ____increased physical activity _____(28)
- ____other _____(29)

UNDERWEIGHT

42. Is this your opinion or someone else's?

- 1. Mother's opinion
- 2. Husband's opinion
- 3. Friends/relatives _____(30)
- 4. Dr/Nurse's opinion
- 5. Nutritionist's opinion
- 6. Day Care Teacher
- 7. Other _____

43. Have you tried to correct this problem?

- 1. Yes/Sometimes
- 2. No _____(31)



44. What have you done? ... Anything else?

- ____increase serving sizes/total amount _____(32)
- ____increase snacks _____(33)
- ____increase desserts/high sugar foods _____(34)
- ____limit activity _____(35)
- ____see Dr/Nutritionist for diet _____(36)
- ____other _____(37)

"I'd like to move on to the second part of the questionnaire, which is about where parent's receive information on nutrition and how to feed their family."

49. Where have you received information on nutrition and how to feed (NAME)? - think of both people and places.

... anyone else?

... anyplace else?

- | | |
|--|-------------------------------|
| <input type="checkbox"/> doctor | <input type="checkbox"/> (55) |
| <input type="checkbox"/> nutritionist/dietitian | <input type="checkbox"/> (56) |
| <input type="checkbox"/> Home economics teacher | <input type="checkbox"/> (57) |
| <input type="checkbox"/> nurse/public health nurse | <input type="checkbox"/> (58) |
| <input type="checkbox"/> dentist | <input type="checkbox"/> (59) |
| <input type="checkbox"/> prenatal class | <input type="checkbox"/> (60) |
| <input type="checkbox"/> school/university courses | <input type="checkbox"/> (61) |
| <input type="checkbox"/> common sense/experience | <input type="checkbox"/> (62) |
| <input type="checkbox"/> husband | <input type="checkbox"/> (63) |
| <input type="checkbox"/> mother/mother-in-law | <input type="checkbox"/> (64) |
| <input type="checkbox"/> friends/other relatives | <input type="checkbox"/> (65) |
| <input type="checkbox"/> day care personnel | <input type="checkbox"/> (66) |
| <input type="checkbox"/> weight control groups | <input type="checkbox"/> (67) |
| <input type="checkbox"/> fitness instructor | <input type="checkbox"/> (68) |
| <input type="checkbox"/> health food stores | <input type="checkbox"/> (69) |
| <input type="checkbox"/> library books/pocketbooks | <input type="checkbox"/> (70) |
| <input type="checkbox"/> magazine articles | <input type="checkbox"/> (71) |
| <input type="checkbox"/> newspaper articles | <input type="checkbox"/> (72) |
| <input type="checkbox"/> cookbooks | <input type="checkbox"/> (73) |
| <input type="checkbox"/> pamphlets | <input type="checkbox"/> (74) |
| <input type="checkbox"/> Canada's Food Guide | <input type="checkbox"/> (75) |
| <input type="checkbox"/> radio/television | <input type="checkbox"/> (76) |
| <input type="checkbox"/> lectures/displays | <input type="checkbox"/> (77) |
| <input type="checkbox"/> other _____ | <input type="checkbox"/> (78) |
| <input type="checkbox"/> no sources used | <input type="checkbox"/> (79) |

50. Which source do you use most often to obtain information on nutrition?

Card 3

specify _____

____(5)

51. Which source of nutrition information was the most helpful?

specify _____

____(6)

"For the last part of the questionnaire, I'd like to ask you a few questions about you and your family."

52. Are there any other children in the family?

___Y ___N



53. How old are they?

1. _____

2. _____

3. _____

4. _____

5. _____

Family Size ____ (7)

Birthrank ____ (8)

54. What type of work does the main wage earner do?

specify _____

____(9)

____(10)

55. Do you work outside the home? - either fulltime or part-time?

1. Fulltime 2. Part-time 3. No 4. Student ____ (11)

56. What if the highest level of education that you have finished?

specify _____ (12)

____ (13)

"Thank you very much for taking time to help us with this survey - we really appreciate it!"

"Would you like to receive a copy of the results - or a pamphlet on preschool nutrition?"

_____ results

_____ pamphlets

NAME: _____

ADDRESS: _____

CODE: _____

Appendix C

LETTER OF INTRODUCTION



UNIVERSITY OF MANITOBA

FACULTY OF HUMAN ECOLOGY
Department of Foods and Nutrition

Winnipeg, Manitoba
Canada R3T 2N2

(204) 474-9554

Dear

The Department of Foods and Nutrition of the University of Manitoba is interested in finding out how Canadian mothers feed their preschool children. Surprisingly, there is little information available on this topic. Therefore, Health and Welfare Canada has given support to this project, as further information would be helpful to health professionals when advising mothers.

We understand that you have a preschool child two to three years of age. Your name was given to us by a government office in the strictest confidence. The name of you or your child will not appear on any of our reports.

We will be telephoning you shortly to talk about how you feed your preschool child, where you obtain information about nutrition, and a few questions about you and your family. The interview will last about fifteen minutes.

Your participation in our survey is voluntary, but we would be most grateful if you would agree to help us with this project. If you participate, we will be happy to send you a copy of the results and a pamphlet on preschool nutrition. If you do not wish to participate, please let us know when we call.

Thank you for your time and consideration.

Yours truly,

Lynn M. Gates
Project Coordinator
Preschool Feeding Survey

Appendix D

POPULATION CHARACTERISTICS OF SUBJECTS SUCCESSFULLY
CONTACTED VERSUS A PORTION OF THE SAMPLE CONTACTED VIA
REFERRAL BY PUBLIC HEALTH RECORDS

POPULATION CHARACTERISTICS OF SUBJECTS SUCCESSFULLY CONTACTED
 VERSUS A PORTION OF THE SAMPLE CONTACTED VIA
 REFERRAL BY PUBLIC HEALTH RECORDS

VARIABLE	NON-MOVED SAMPLE N = 321	MOVED SAMPLE N = 16	t VALUE
MATERNAL AGE (mean age in years)	30.98	28.56	-2.147 ^a
AGE OF CHILD (mean age in years)	2.80	3.06	1.7963
FAMILY SIZE (mean number of children)	2.41	2.56	.5943
EDUCATION SCORE (mean score)	54.97	52.43	-1.3331
OCCUPATION SCORE (mean score)	53.85	56.06	1.0992
SES SCORE (mean score)	59.99	59.13	- .4712

^asignificant at the 5% level

Appendix E

CHI-SQUARE ANALYSIS OF MATERNAL CONCERN ABOUT LIMITED
VEGETABLE INTAKE IN RELATION TO CONCERN ABOUT FUSSY EATING
HABITS AND AMOUNT OF FOOD CONSUMED

CHI-SQUARE ANALYSIS OF
 MATERNAL CONCERN ABOUT LIMITED VEGETABLE INTAKE IN RELATION
 TO MATERNAL CONCERN ABOUT FUSSY EATING HABITS AND AMOUNT OF
 FOOD CONSUMED

<u>Source</u>	<u>DF</u>	<u>X²</u>	<u>P</u>
Intercept	1	15.67	.0001
Fussy	1	12.31	.0005
Food Consumed	1	2.14	.1434
Fussy*Food Consumed	1	6.28	.0122

Appendix F

CHI-SQUARE ANALYSIS OF MATERNAL CONCERN ABOUT LIMITED FOOD
INTAKE IN RELATION TO CONCERN ABOUT LIMITED VEGETABLE
INTAKE AND FUSSY EATING HABITS

CHI-SQUARE ANALYSIS OF
MATERNAL CONCERN ABOUT LIMITED FOOD INTAKE IN RELATION TO
MATERNAL CONCERN ABOUT FUSSY EATING HABITS AND LIMITED
CONSUMPTION OF VEGETABLES

<u>Source</u>	<u>DF</u>	<u>χ^2</u>	<u>P</u>
Intercept	1	47.41	.0001
Vegetables	1	2.14	.1434
Fussy	1	0.94	.3329
Vegetables*Fussy	1	6.28	.0122

Appendix G

CHI-SQUARE ANALYSIS OF MATERNAL CONCERN ABOUT MILK INTAKE
IN RELATION TO MATERNAL RATING OF APPETITE AND CONCERN
ABOUT LIMITED VEGETABLE INTAKE

CHI-SQUARE ANALYSIS OF
 MATERNAL CONCERN ABOUT MILK CONSUMPTION IN RELATION TO
 MATERNAL RATING OF APPETITE AND CONCERN ABOUT LIMITED
 VEGETABLE INTAKE

<u>Source</u>	<u>DF</u>	<u>X²</u>	<u>P</u>
Intercept	1	70.06	.0001
Vegetable	1	1.77	.1830
Appetite	1	0.80	.8710
Vegetable*Appetite	1	3.93	.0476

Appendix H

CHI-SQUARE ANALYSIS OF THE MATERNAL PRACTICE OF COAXING
PRESCHOOL CHILDREN TO EAT IN RELATION TO MATERNAL RATING
OF APPETITE AND MATERNAL CONCERN ABOUT LIMITED VEGETABLE
INTAKE

CHI-SQUARE ANALYSIS OF
MATERNAL PRACTICE OF COAXING PRESCHOOL CHILDREN TO EAT
IN RELATION TO MATERNAL RATING OF APPETITE AND MATERNAL
CONCERN ABOUT LIMITED VEGETABLE INTAKE

<u>Source</u>	<u>DF</u>	<u>X²</u>	<u>P</u>
Intercept	1	1.05	.3060
Appetite	1	0.36	.5461
Vegetable	1	3.80	.0513
Appetite*Vegetable	1	8.11	.0044

Appendix I

CHI-SQUARE ANALYSIS OF MATERNAL USE OF FOOD TO ENCOURAGE
PRESCHOOL CHILDREN TO EAT IN RELATION TO PLACE OF
RESIDENCE AND EMPLOYMENT STATUS

CHI-SQUARE ANALYSIS OF
 MATERNAL USE OF FOOD TO ENCOURAGE PRESCHOOL CHILDREN TO EAT
 IN RELATION TO PLACE OF RESIDENCE AND MATERNAL EMPLOYMENT
 STATUS

<u>Source</u>	<u>DF</u>	<u>X²</u>	<u>P</u>
Intercept	1	64.11	.0001
Residence	1	11.81	.0006
Employment Status	1	0.08	.7809
Residence*Employment Status	1	6.97	.0083

Appendix J

CHI-SQUARE ANALYSIS OF MATERNAL USE OF FOOD TO ENCOURAGE
PRESCHOOL CHILDREN TO EAT IN RELATION TO FAMILY SIZE AND
OCCUPATIONAL STATUS

CHI-SQUARE ANALYSIS OF
 MATERNAL USE OF FOOD TO ENCOURAGE PRESCHOOL CHILDREN
 TO EAT IN RELATION TO FAMILY SIZE AND OCCUPATIONAL
 STATUS

<u>Source</u>	<u>DF</u>	<u>X²</u>	<u>P</u>
Intercept	1	65.12	.0001
Occupation	1	1.58	.2093
Family Size	1	1.92	.1660
Occupation*Family Size	1	8.46	.0036

Appendix K

CHI-SQUARE ANALYSIS OF MATERNAL USE OF FOOD TREATS AS
REWARDS IN RELATION TO PLACE OF RESIDENCE AND FAMILY SIZE

CHI-SQUARE ANALYSIS OF
MATERNAL USE OF FOOD TREATS AS REWARDS IN RELATION TO PLACE
OF RESIDENCE AND FAMILY SIZE

<u>Source</u>	<u>DF</u>	<u>X²</u>	<u>P</u>
Intercept	1	9.64	.0019
Residence	1	10.27	.0014
Family Size	1	0.62	.4308
Residence*Family Size	1	5.57	.0183

Appendix L

CHI-SQUARE ANALYSIS OF MATERNAL AWARENESS OF THE RELATION
OF EARLY CHILDHOOD EATING HABITS TO MATERNAL AGE AND
EMPLOYMENT STATUS

CHI-SQUARE ANALYSIS OF
MATERNAL MENTION OF THE RELATION OF THE FORMATION OF PROPER
EATING HABITS DURING CHILDHOOD TO ADULT HEALTH IN RELATION
TO MATERNAL AGE AND EMPLOYMENT STATUS

<u>Source</u>	<u>DF</u>	<u>X²</u>	<u>P</u>
Intercept	1	21.93	.0001
Age	1	2.79	.0950
Employment Status	1	0.06	.8028
Age*Employment Status	1	7.95	.0048

Appendix M

CHI-SQUARE ANALYSIS OF TYPE OF INFORMATION SOURCE
CONSIDERED MOST HELPFUL BY MOTHERS OF PRESCHOOL CHILDREN
IN RELATION TO SES AND EMPLOYMENT STATUS

CHI-SQUARE ANALYSIS OF
 TYPE OF INFORMATION SOURCE CONSIDERED MOST HELPFUL BY
 MOTHERS OF PRESCHOOL CHILDREN IN RELATION TO SES AND
 EMPLOYMENT STATUS

<u>Source</u>	<u>DF</u>	<u>X²</u>	<u>P</u>
Intercept	2	29.38	.0001
SES	2	6.61	.0367
Employment Status	2	0.62	.7338
SES*Employment Status	2	6.47	.0394

Appendix N

CHI-SQUARE ANALYSIS OF MATERNAL USE OF BOOKS TO OBTAIN
NUTRITION INFORMATION IN RELATION TO PLACE OF RESIDENCE
AND MATERNAL EDUCATION

CHI-SQUARE ANALYSIS OF
MATERNAL USE OF BOOKS TO OBTAIN NUTRITION INFORMATION IN
RELATION TO PLACE OF RESIDENCE AND MATERNAL EDUCATION

<u>Source</u>	<u>DF</u>	<u>X²</u>	<u>P</u>
Intercept	1	53.58	.0001
Residence	1	0.41	.5198
Education	1	1.46	.2265
Residence*Education	1	4.62	.0317

Appendix 0

CHI-SQUARE ANALYSIS OF MATERNAL USE OF PRENATAL CLASSES TO
OBTAIN NUTRITION INFORMATION IN RELATION TO MATERNAL AGE
AND EMPLOYMENT STATUS

CHI-SQUARE ANALYSIS OF
MATERNAL USE OF PRENATAL CLASSES TO OBTAIN NUTRITION
INFORMATION IN RELATION TO MATERNAL AGE AND EMPLOYMENT
STATUS

<u>Source</u>	<u>DF</u>	<u>X²</u>	<u>P</u>
Intercept	1	73.79	.0001
Age	1	3.23	.0724
Employment Status	1	1.02	.3124
Age*Employment Status	1	11.07	.0009

Appendix P

CHI-SQUARE ANALYSIS OF MATERNAL USE OF PRENATAL CLASSES TO
OBTAIN NUTRITION INFORMATION IN RELATION TO FAMILY SIZE
AND EMPLOYMENT STATUS

CHI-SQUARE ANALYSIS OF
MATERNAL USE OF PRENATAL CLASSES TO OBTAIN NUTRITION
INFORMATION IN RELATION TO FAMILY SIZE AND EMPLOYMENT STATUS

<u>Source</u>	<u>DF</u>	<u>X²</u>	<u>P</u>
Intercept	1	75.35	.0001
Family Size	1	4.43	.0352
Employment	1	0.83	.3630
Family Size*Employment	1	3.89	.0485