

A Comparison of Three Methods of
Assessing the Nutrition Education Needs
of At-Home Mothers of Preschoolers

A Thesis

Submitted to the Faculty of Graduate Studies
in Partial Fulfillment of the Requirements
for the Degree of
Master of Continuing Education
in the College of Education
University of Saskatchewan

by

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ABSTRACT

Needs assessment is generally recognized as an important component of program planning and decision-making processes. However, a better understanding is required of the relative worth of various methods used to assess educational needs and, particularly, nutrition education needs.

This study was designed to investigate the relationship among three methods of needs assessment. More specifically, it compared a perceived needs assessment method with two alternate methods based on assessments of knowledge and food consumption. The four food groups of Canada's Food Guide were used as the basis of comparison among the methods. Home interviews were conducted by the researcher with a selected sample of mothers of three year old children in the Regina Rural Region of Saskatchewan Health. Instruments used during the interviews were developed or adapted to collect data concerning mothers' perceived needs, their nutrition knowledge, the food intake of their preschoolers, and relevant demographic variables.

Analysis of the data involved correlating mothers' perception scores with scores based on their nutrition knowledge and on the food consumption of their preschoolers for each of the four food groups. Tabulations of frequencies to provide descriptive information about the characteristics of the sample were also included in the analysis.

The findings indicated non-significant correlations for the data in all but one instance. This research, therefore, was not able to

support the existence of relationships among the three methods of needs assessment tested in a well educated population of mothers. Although more thorough testing of the instruments used to collect the data is required, the research lends support to the contention that some major differences exist among the three methods of needs assessment investigated and suggests possible implications for program planning.

ACKNOWLEDGEMENTS

I wish to thank Dr. Gwenna Moss, my advisor, and Ms. Eva Lee and Ms. Lorraine Hill, members of my thesis committee, for their guidance and continuous encouragement throughout this research.

I also wish to thank the Saskatchewan Department of Health for making this research possible. I am particularly grateful to the Executive Director of the Community Health Services Branch, Dr. Hugh Walker, and to the Director and Medical Health Officer of the Regina Rural Region, Dr. Abe Krahn, for their permission and support of this study. My special thanks also goes to all the public health nurses in the Regina Rural Region who assisted with the identification of the mothers of preschoolers.

Recognition is extended to all those Saskatchewan nutritionists and dietitians who provided valuable comments and suggestions during different stages of development and testing of the data collection instruments. Also recognized are the public health nursing staff in Moose Jaw who cooperated in the preliminary testing of the knowledge instrument. A special thanks goes to consultants Barry Guest and Colleen Martin with the Saskatchewan Computer Utility for their computer assistance. The typing skill of Evelyn Pollock is also gratefully appreciated.

I am particularly grateful to all those moms who took the time to answer my questions and to share their experiences.

Finally, I wish to thank my husband, without whose patience and assistance this research would not have been completed, and to our families and friends for their interest and support.

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CHAPTER 1

NATURE AND PURPOSE OF THE STUDY

1.1 General Background and Statement of the Problem

It is during the preschool years that eating habits are developed. In general, parents have a major influence upon this development. Yet little exists in the way of nutrition education programs and resources to assist Saskatchewan parents in the important role they play in feeding their children.

A study in 1979 to review child and youth services in Saskatchewan verified the lack of programs directed at parents and preschoolers, leading to the release of a report by the Department of Health in support of the view that greater emphasis should be given to parent education (Saskatchewan Health for Children and Youth, 1980).

In order to make informed decisions concerning programs for this target group, however, it is important to identify as accurately as possible the specific nutrition education needs of parents and their preschoolers. It is particularly crucial during times of financial restraint when nutrition educators, and other health professionals,

have to become more accountable for the programs they offer. They have to demonstrate to administrators and the public that their programs are meeting the needs of the people they serve, and that they are meeting them effectively.

Researchers concur that needs assessment is an important component of program planning. Mamazian (1977) states:

Needs assessments gather qualitative and/or quantitative information so that decision-makers in education can better determine the nature, extent and priority of educational needs. Educators use this information to change and improve education--to make education generally more effective. (p. 28)

Mamazian (1977), quoting Barbulesco, goes on to say:

The ultimate purpose of a needs assessment is to provide an empirical basis for decision-making about matters related to education, for example the allocation of resources or the content area, style of teaching or learning and general organization of educational programs. (p. 28)

Although needs assessment is recognized as an important component of program planning and decision-making processes the literature provides little information on the relative worth of various methods used to assess educational needs. Furthermore, results arising from the few studies undertaken in this area offer conflicting evidence.

The findings of MacDonald (1977), for example, suggest that the perceived needs method (a method based on self-defined needs) and audit-based methods (methods based on assessments of patient outcome and nursing care) can be regarded equally valid methods for identifying nursing educational needs in the area of myocardial infarction. MacDonald (1977) concludes that, this being the case, perceived needs assessment methods are economically

and socially accountable methods for identifying nursing educational needs.

Hiemstra and Long (1974), on the other hand, suggest that there are some very significant differences between perceived needs and more objectively-derived needs which they call real needs. They conclude that more than one method should be used to identify educational needs of physical therapists if resulting programs are to be successful.

In the field of nutrition it is virtually unknown whether there is a relationship between educational needs identified by methods considered to be more objective (e.g., prescribed needs or expert-defined needs) and needs that clients perceive themselves as having such as felt or self-defined needs.

Nutrition practitioners who plan programs locally commonly rely on methods which identify the felt needs of their clients. For the purpose of this study, such methods will be referred to as "perceived needs assessment" methods. Such methods ask clients what they perceive they need whether it is via a simple checklist or a sophisticated questionnaire.

Other methods used by nutritionists include assessments based on clients' knowledge and eating habits. These methods differ from the perceived needs assessment methods in that they first require the determination of acceptable standards or criteria against which to measure the clients' existing practices. Needs derived from these methods are sometimes referred to as prescribed needs. These methods usually require more resources in terms of money, time, and personnel and consequently are used less often.

In view of the above, it is felt that research which compares a commonly used perceived needs assessment method with two alternate methods based on assessments of knowledge and eating habits will help to contribute to a better understanding of the relative worth of these methods and their implications for planning nutrition education programs.

1.2 Goals and Hypotheses

The major goal of this study is to determine the degree of correspondence (i.e., the relationship) among three methods of needs assessment including: a perceived needs assessment, an assessment of at-home mothers' nutrition knowledge, and an assessment of preschoolers' eating habits. The four food groups of Canada's Food Guide are used as the basis of comparison among the methods. A secondary goal is to develop and operationalize instruments to obtain the data required for the study.

Thus it is hypothesized that:

Felt needs identified by at-home mothers of preschoolers correspond to prescribed needs based on an assessment of at-home mothers' nutrition knowledge of the four food groups.

Felt needs identified by at-home mothers of preschoolers correspond to prescribed needs based on an assessment of the food intake of preschoolers in relation to the four food groups.

The above hypotheses stated in the null form are as follows:

There is no relationship (correspondence) between educational needs identified as felt needs and those identified to be prescribed needs based on an assessment of at-home mothers' nutrition knowledge of the four food groups.

There is no relationship (correspondence) between needs identified as felt needs and those identified to be prescribed needs based on an assessment of food intake of preschoolers in relation to the four food groups.

1.3 Definitions of Terms

Needs Assessment - A systematic procedure by which educational needs are identified.

Perceived Needs Assessment - A method of identifying "felt" needs of at-home mothers in relation to the basic four food groups.

Knowledge-Based Needs Assessment - A method of identifying "prescribed" needs of at-home mothers in relation to their nutrition knowledge of the basic four food groups.

Food Consumption-Based Needs Assessment - A method of identifying the "prescribed" needs of at-home mothers in relation to their preschoolers' intake of the basic four food groups as reported by the mothers.

Felt Need - A gap or deficit or deficiency that at-home mothers perceive themselves as having (i.e., a self-defined gap).

Prescribed Need - A gap or deficit or deficiency relative to an acceptable standard defined by "experts" in nutrition (i.e., an expert-defined gap).

Educational Need - A felt or prescribed need which can at least partially be satisfied via educational or learning experiences.

Nutrition Education Need - An educational need related to the basic four food groups.

At-Home Mother - The mother of a preschooler who has been responsible for the supervision of the child for at least the previous week and is fully aware of her child's daily dietary intake.

Preschooler - A child who is three years old with a birthdate from September 1, 1977 to July 1, 1978 inclusive.

1.4 Delimitations

This research is conducted under the auspices of Saskatchewan Health in conjunction with a 'Community Services Branch project. It focusses on the nutrition education needs of mothers and preschoolers, a population group felt by Saskatchewan Health to require more concentrated effort in terms of programming.

The study is restricted to an identification of nutrition education needs related to the basic four food groups of Canada's Food Guide. Furthermore, it examines only three methods of needs assessment including a perceived needs assessment and assessments of mothers' knowledge and preschoolers' food intake as reported by mothers.

The research is further delimited to a needs assessment of at-home mothers who have a three year old child and who reside in the Regina Rural Region of Saskatchewan Health. In addition the research is conducted during the summer months, one season of the year.

1.5 Significance

This research attempts to answer the question: Do self-defined (felt) needs actually correspond with expert-defined (prescribed) needs? In the search for an answer, it is hoped that a better understanding will be attained concerning some of the methods used to identify nutrition educational needs and their implications for program planning.

From a practical point of view, it may help to provide some justification for the expenditure of additional resources often required when more than one method of assessment is used or particularly when using methods considered to be more objective. On the other hand, if it is shown that fewer resources are required to accurately assess needs (via the use of a perceived needs assessment method alone for example) then a greater proportion of these resources can be dedicated to actually meeting those needs.

Furthermore, the degree of correspondence between methods may provide additional important information for educational programming itself. If, for example, it is found that felt needs based on perceptions of the target group do not correspond to prescribed needs then, perhaps, greater program effort is needed to increase parent awareness prior to educational efforts which attempt to increase their knowledge or change eating behavior.

CHAPTER 2

A REVIEW of RELATED LITERATURE

This chapter begins with a discussion of the many terms used to describe the concept of need in an attempt to clarify these terms as defined in the present study. It then discusses some of the general approaches used by different authors to assess needs. An examination of different methodologies used to assess eating habits, nutrition knowledge, and perceived needs concludes the chapter.

2.1. The Concept of Need

Leagans (1964) notes that the word "need" is a simple and innocent appearing four-letter word, but is probably the most deceptively complex, basically significant, and far-reaching in implications of all major terms in the vocabulary of the adult educator.

A wide range of definitions is used to describe the concept of need. However, an overview of the literature indicates that there is no general consensus by authors about what needs are or how to measure them. As Scissons (1980) points out in a paper on assessment of

educational need in business programming, need is not a unitary concept. He explains that different terms assume importance depending on how the user decides to define needs and, therefore, cautions those who use needs identification results for program development to be aware of the particular definitions they are using.

The definitions of need can be organized into four major categories according to Bradshaw (1974). These include basic human needs, felt and expressed needs, normative needs, and comparative needs. Since the present study examines the relationship between felt needs and normative needs, also known as prescribed needs, it is these two categories that are discussed more fully below.

A felt need is most often described as an individual want or desire. Felt needs suggest a means of gratification and imply an ultimate goal (Monette, 1977). In addition, felt needs may or may not be expressed in terms of a demand. However, when felt needs are turned into action they become expressed needs (Bradshaw, 1974).

A felt need may also be defined as a deficiency relative to a specific individually or self-defined goal or end state (Beatty, 1976). However, as Misanchuk and Scissons (1978) point out, there are limitations in asking an individual what ought to be. For example, an individual may define what ought to be in terms of (a) what he perceives his job requires, (b) what he is interested in learning about or (c) what he is already good at. To overcome this problem the authors define "want" as a combination of two components for the purpose of their study on business training needs. The first component is desire

which they use synonymously with interest. This desire component is then combined with a competence component or a relevance component, to become what the authors further define as either a competence weighted want (i.e., an individual's interest to learn about an activity in which he indicates a lack of competence) or a relevance weighted want (i.e., an individual's interest to learn about an activity important to his job).

Confusion sometimes arises when examining the literature on felt needs because of the multiplicity of meanings that are associated with certain terms. For example, want or felt need may mean desire or interest as defined by Atwood and Ellis (1971). On the other hand, want may be used as a term which encompasses interest as only one component as seen above. Knowles (1970) further distinguishes want as something quite different from interest which he defines as a liking or preference.

Normative need is another way in which Bradshaw (1974) categorizes the concept of need. "A need may be called normative when it constitutes a deficiency or gap between a 'desirable' standard and the standard that actually exists" (Monette, 1977, p. 118). Normative need is an expert-defined need as Bradshaw (1974) explains.

Keeping the above definition in mind, a variety of terms described in the literature could be considered under the umbrella of normative need. For example, Beatty (1976) refers to a condition of deficiency relative to a socially accepted standard, norm, or end state as a prescribed need. Archambault (1957) uses the term genuine need to

describe a need recognized on the basis of an objectively demonstrable deficiency of an intended learner in relation to his environment.

Atwood and Ellis (1971) refer to such a need as a real need. They also point out that a real need does not differ essentially from a need in the prescriptive sense. However, their major emphasis is that the deficiency "actually" exists as distinct from one that is only thought to exist.

Griffith (1978) in a discussion of genuine and real needs remarks that such qualifiers are employed in a "masquerade of false precision" conveying a "pseudo-scientific air" (p. 389). Perhaps Griffith's (1978) greatest objection to terms such as real is that they convey the meaning that such needs are absolute. As Monette (1977) cautions, normative needs are not absolute. For example, standards set by various experts may be conflicting due to different value judgements. It, therefore, becomes important to recognize the relative conditions upon which such standards are based, and that these will change with time depending on developments in knowledge and changes in the values of society. All needs whether they are felt, prescribed, basic human needs, or some other variation imply a judgement of value. However, this fact may be more easily overlooked in relation to the normative need which is viewed as being somewhat more objectively derived.

In spite of the variety of terms that might be used to describe a particular need, most authors make a distinction between felt and normative-type needs. Prescriptive needs are culturally determined; felt needs are culturally conditioned, Beatty (1976) suggests. Beatty

(1976) and others (Atwood and Ellis, 1971; Monette, 1977) make the point that any particular prescriptive need can at the same time be a felt need, however, not all felt needs are necessarily prescribed needs. They rationalize that felt needs are limited by an individual's perceptions of the need. For example, he may not be aware that he has a need.

Other variations of the term need are also used in the literature such as educational need. Knowles (1970) defines educational need as "something a person ought to learn for his own good, for the good of the organization or for the good of society" (p. 85). He also refers to educational need as "the discrepancy between what an individual (or organization or society) wants himself to be and what he is..." (Knowles, 1970, p. 86). Thus, as MacDonald (1977) suggests, Knowles refers to educational need as both a desire and a requirement, thereby, encompassing a rather broad conceptualization of the term.

Knox (1968) and Atwood and Ellis (1971) also describe educational need. In their view, educational need is a need that can be satisfied by means of a learning experience. On the basis of their definition, both felt and normative needs may or may not be educational needs depending on whether they can be satisfied, at least partially, by an educational experience. For purposes of the present study, both felt and prescribed needs are considered to be educational needs based on this latter definition.

In an attempt to examine the concept of need in a broader context and after conducting a review of numerous definitions of need,

Saraswathi (1969) sums up her findings by suggesting that the term implies:

...the existence of a gap or missing link between the actual existing status and the desirable status for the individual or group whether it be in values to be realized; feelings to be satisfied; tensions to be relieved; conditions to be changed; knowledge, experience or ability to be improved; objectives to be accomplished; or norms to be conceptualized. (p. 5)

This view is further supported by Roth (1977) who states that the term need is usually "defined (implicitly if not explicitly) as a discrepancy between a target state and actual or present state" (p. 15). However, in an attempt to make explicit the context in which such needs are defined, she compares the five types of needs which she finds in the literature according to the following discrepancy formula ($X - A = N$, or target state - actual state = need).

If X represents an ideal state, then:

ideal - actual = goal discrepancy

Similarly, if X represents the norm, minimal satisfactory state, desired state, or expected state, then:

norm - actual = social discrepancy

minimal - actual = essential discrepancy

desired - actual = want (desired discrepancy)

expected - actual = expectancy discrepancy

While providing a useful and explicit conceptualization of need as a discrepancy, Roth and Scriven (1977) also discuss some important limitations of such a concept of need. Although certain key information

is obtained such as the identification that a need exists and to what extent it exists, the discrepancy formula alone does not provide information about what is needed (treatment) nor by whom. What is required they suggest is a single definition of need which captures both aspects: the discrepancy definition as well as a definition which concretely describes what is needed and by whom. At the present time and to this researcher's knowledge such a comprehensive definition does not exist and is beyond the scope of the present study.

2.2 Approaches Used in Needs Assessment

Educational needs assessment is defined in a variety of ways but generally involves a systematic procedure or process for identifying educational needs. As Mamazian (1977) points out, "There is no one universally accepted model of the process" (p. 11). Even the terms used in the literature to refer to the needs assessment process vary to include need identification, need analysis, discrepancy analysis, and need diagnosis.

As a result of the numerous models and methods available for assessing needs, adult educators attempt to organize these approaches into a variety of classification schemes (Knowles, 1970; Kaufman, 1977; McKinley, 1973; Witkin, 1977).

Models which use a systems approach are viewed as probably the most comprehensive of approaches to needs assessment. Based on the pioneering work of Kaufman (1977), the systems approach is often considered to be the "classical" method of assessing educational needs

or goal discrepancies as Roth (1977) refers to them. Below are the four steps generally associated with this method as described by Witkin (1977):

(a) generate goals and rank them for importance--that is determine desired conditions; (b) determine the present status of each goal, or existing conditions; (c) identify and analyze discrepancies between goals and the present status; and (d) assign priorities to the discrepancies...The whole process is usually, then, conceptualized as the 'front end' of educational planning, and the outputs of the needs assessment are used by decision-makers for general or specific program initiation or modification. (p. 5)

Models that use the complete systems approach, although comprehensive, require far more resources than are often available and consequently are used less frequently in their entirety. Strategies more typically used by educators are provided in an overview by Witkin (1977) and grouped into nine sections including: (a) goal rating procedures, (b) methods of gathering performance and other data on existing conditions, (c) discrepancy survey questionnaires, (d) complete kits for school use, (e) futuring techniques, (f) specialized techniques such as critical incident and fault tree analysis, (g) regional and state models, (h) community occupational needs assessment, and (i) communication-focussed methods. Many of these are available in the form of prepackaged kits or established tools which can be adapted for local use.

It is within the context of Witkin's second grouping of strategies, section (b) above, that the present study is conducted. This needs assessment approach utilizes methods of gathering data regarding

respondents' perceptions, their performance or practices, demographic characteristics, and/or other relevant data. Such data help to provide an assessment of the needs of a particular target group based upon the status of existing conditions or goals, information of particular value to the present study.

Keeping this framework in mind, the remaining sections of the chapter examine some of the methodologies used to identify specific educational needs based on an assessment of eating habits, nutrition knowledge, and perceptions. Special focus is given to methodologies used with the preschool population where applicable.

2.3 Food Consumption-Based Needs Assessment (Assessment of Eating Habits)

Although it is recognized that needs identified by measuring deficits in existing eating habits may not all be satisfied by educational efforts, there is sufficient evidence to assume that such needs can at least partially be satisfied through educational means and, therefore, considered to be educational needs (Alford and Tibbets, 1971; Harrill, Smith and Gangever, 1972; Head, 1974; Ireton and Guthrie, 1972).

In addition, the assessment of eating habits is discussed here within the context of food consumption as opposed to food preferences or other measures or indicators of eating habits. Sometimes these measures are alternated inappropriately in studies concerning the eating habits of young children. However, Yperman and Vermeerch (1979) who conducted a study of 300 primary grade children caution that food preferences; dietary complexity, based on food consumption data; and

participation in school lunches should not be used interchangeably to represent eating habits of children. They go on to explain that each measure is an independent variable and is related to a different set of factors from the home, school, and social environments.

Assessment of eating habits in the context of the present study compares the existing food consumption of preschoolers to Canada's Food Guide (1977) in order to identify deficits or gaps. Because Canada's Food Guide (1977) is defined by experts, needs or deficits identified on the basis of such a standard may be referred to as normative or prescribed needs. Standards generally used to assess needs on the basis of eating habits are addressed more fully later in this section.

There are several methods for collecting data on the existing food consumption of individuals or groups. Marr (1971) notes that some originate from an interest in food requirements; others from the study of the association of diet with disease. Becker, Indik, and Beeuwkes (1960), for example, provide an extensive literature review of dietary intake methodologies emphasizing methods suitable for epidemiological studies of disease. Mongeau (1974) discusses other purposes for collecting dietary data. These include:

- (a) To classify a population in terms of nutritional risk,
- (b) To identify, in a population, the groups that are at high nutritional risk,
- (c) To define the objectives and set a basis for nutrition programs. (p. 14)

Which method or combination of methods is selected from the many available is largely dependent on the suitability of the method for a given purpose. Each has its strengths and limitations.

Based on the comprehensive reviews of Becker et al. (1960) and Marr (1971), methods of collecting individual dietary data are generally classified into one of two broad categories: recording of present intake or recalling past intake.

The first category involves the use of records of weighed, measured or estimated amounts of food presently consumed. Weighed food records require that food portions be carefully weighed and analyzed chemically or by calculations using a food composition table. In contrast, measured food records use household measures or food models to describe the amounts consumed. These measures are then converted into weights for analysis. Other methods estimate the amounts consumed by recording food intake in the form of menus, for example.

The precise weighing of food by an independent observer is generally considered to be the "standard" against which other methods are compared for validity. As methods depart from this relative standard, varying degrees of precision are lost. The use of food composition tables instead of chemical analysis; the subject himself weighing the food; the use of descriptive measures instead of weighing; and reliance on memory in recall methods, to be discussed later, are all departures from the standard as Marr (1971) explains. It is interesting to note that Young, Chalmers, Church, Clayton, Hagan, Steele, and Tucker (1952) conclude from their research "that errors in estimation of portion size are

probably the largest source of error in diet record-keeping". (p. 132)

The number of days used to record present food intake is also dependent upon the degree of precision required and may vary from one day to seven or more. Heady (1961), among others, indicate that little information is lost by using the dietary data for 3 days rather than that from the 7-day survey.

A major limitation of food records "whether for one, three or seven days, is the burden that they impose on the subject, inducing a drop in the cooperation rate and a bias in the sample, the poorly educated and the low-intelligence people being under-represented," observes Mongeau (1974, p. 19). In general, cooperation rates tend to decline as days used to record intakes increase (Marr, 1971).

The significance of any loss in precision should be weighed in relation to the possible increases in cooperation, thereby, resulting in greater generalizability. Usually, in studies which assess eating habits of individuals or groups for the purpose of programming, as compared to studying diet-related disease or dietary requirements, it is more critical to have an unbiased sample than to obtain a higher level of precision in the data collected (Mongeau, 1974).

Recall of past intake, the second broad category of dietary intakes, is generally discussed in terms of "usual" consumption, better known as the history method; or in terms of food actually consumed during a stated period of time, such as the classical 24-hour recall method.

The first form of recalling past intake is described by Burke (1947) and modified by others for local needs. The history method which is considered to be the most suitable for obtaining an accurate estimate of usual intake makes use of several different approaches. These include the 24-hour recall of food actually consumed with questions about overall eating patterns, a checklist which serves to validate and clarify earlier information, and a menu recorded for three days which Burke considers to be a further check and the least valuable.

The history method requires a skilled interviewer to produce reliable data and can easily overestimate amounts. It is also time-consuming and difficult to pursue, as Mongeau (1974) points out, and is, therefore, best suited to longitudinal studies or studies with small numbers of individuals.

In contrast to the history method, the 24-hour recall obtains actual food intake of the past 24 hours as remembered at an interview, or sometimes on a self-completion questionnaire. Portion sizes of foods consumed are estimated in terms of household measures, models, or a simple menu. The 24-hour recall is the only method at present that is used in large-scale surveys of industrialized countries such as the nation-wide Nutrition Canada Survey (1973). It is often selected on the basis of its simplicity and wide applicability to population groups of varying age, education, and intelligence.

The major limitations of the 24-hour recall are its questionable representation of usual dietary intake and its reliance on memory of

individuals. The extent to which the day reported typifies usual intake varies considerably from person to person (Marr, 1971). With regard to children, Eppright, Patton, Marlatt, and Hathaway (1952) observe:

Different children have adequate diets on different days. The proportion of children in a group who are maintaining a continuously good diet for three to seven days may be very different from the proportion as represented by a single day...analyses of records for shorter periods within the week tend to be misleading in the direction of making dietary conditions seem better than they actually are. (p. 46)

The 24-hour recall, therefore, is not suitable for analysis at the individual level, an important consideration of the present study.

Apart from the 24-hour recall, methods requiring longer periods of memory are used successfully to obtain information regarding food actually consumed. Huenemann, French, and Bierman (1961), for example, obtain recalled food intakes from pregnant women in Kauai for at least four days finding in some instances, however, that considerable prodding and detailed enquiry are necessary to complete a week's dietary picture. In a study by Schwartz (1973), food intake of Ohio high school graduates is successfully obtained by using a 3-day recall method developed by Rudge (1973).

Memory upon which recall methods rely heavily can be stimulated to produce more reliable results. For example, Frank, Berenson, Schilling, and Moore (1977) in a study with 4,500 children from 5 to 14 years obtain a more complete 24-hour recall during interviews by using a detailed protocol consisting of probing questions related to activities. Huenemann et al. (1961) also find that some women are able "to recall

their food intake for each day of an entire week simply by relating their food to their major activity of the day" (p. 569).

Recall methods are most often described in studies with adults. They are also used somewhat successfully with school age children (Emmons and Hayes, 1973; Frank et al., 1977). However, children under five years of age are not considered reliable respondents in dietary surveys (Frank et al., 1977). To assess dietary intake, therefore, the mother of the preschooler must be interviewed or direct observation performed.

Many nutrition surveys are conducted using the technique of interviewing the preschool child's mother regarding the child's dietary consumption (Beyer and Morris, 1974; Nutrition Canada, 1973; Owen, Kram, Garry, Lowe, and Lubin, 1974; Sanjur and Scoma, 1971; Simms and Morris, 1974; Yperman and Vermeerch, 1979). Among the methods used are the 24-hour recall, 1 and 3-day food records, and food frequency methods discussed below. Few studies, however, are available which indicate the validity of maternal reporting. Glovsky's (1977) research indicates that mothers of middle to upper-class background have a good working knowledge of their children's food preferences and, perhaps, total dietary intake. Although Glovsky (1977) suggests that her findings may be applicable to total dietary intake or food consumption, she does not actually study this aspect. It is also worth noting that Emmons and Hayes (1973) and Owen et al. (1974) suggest that working mothers, or those away from their children a portion of each day, may not know what their children consumed.

In both record and recall methods previously described, an effort is made to estimate the quantity of foods consumed. Precision varies depending on such factors as whether the food is weighed or described in household measures or according to some other procedure. For reasons of time and economy some of these methods are not considered to be practical especially in large scale surveys. Therefore, in an attempt to overcome the problems associated with estimating quantities of food consumed, dietary intakes are assessed on the basis of the frequency with which food is eaten.

Dietary interview methods using frequency of intake of various food, tested with adult subjects, are reported to provide qualitative information of food patterns generally in agreement with that from quantitative estimates of food consumption. For example, Stefanik and Trulson (1962) who obtained recalled frequencies of food consumed from university students conclude that their shorter method provides equivalent estimates of qualitative intakes, at both individual and group levels, when compared to the longer seven-day record and dietary history. Also, in a study by Abramson, Slome, and Kosovsky (1963) on a group of pregnant Jewish women, moderate to high correlations are found between the number of times food is taken per week and the estimated amounts taken per week.

Although methods used in the above studies are able to detect differences or trends in dietary patterns, they are limited in that they do not predict nutrient intakes. Other studies, however, such as the one by Heady (1961) demonstrate the use of frequency data to

classify a group of bank clerks according to their nutrient intake. Although this finding in itself is not widely applicable, a significant outcome of the research is that consumption of food can be reliably and validly determined by counting frequencies without any weighing or measuring required no matter how approximate.

In a further attempt to verify whether consumption frequency is a good indicator of nutrient intake, Desaulnier (1979) is presently completing a three-year study of Quebec families. Her findings may help to support the work started by Heady (1961) among others.

Once food consumption data are gathered by record, recall, or food frequency methods, or by some combination of these methods, dietary quality is then assessed in relation to an acceptable standard to identify gaps or deficits in eating habits.

There are two standards commonly used in Canada to evaluate food consumption patterns:

- (a) The Recommended Daily Nutrient Intake in a Dietary Standard for Canada (1975)
- (b) Canada's Food Guide (1977)

The Recommended Daily Nutrient Intake (RDNI) specifies the nutrients needed by almost all Canadians daily. Existing nutrient intakes are calculated from food consumption data using food composition tables which specify the nutrient content of foods. Nutrient intakes are then assessed in relation to the RDNI to identify needs. Canada's Food Guide, a second standard, outlines a four food group intake pattern based on the RDNI. To assess dietary quality of food intake

based on the food guide as a standard, scores are generally assigned according to the degree of compliance with the four food group pattern (Aucoin, Haley, Rae, and Cole, 1972; Rewko, Rodey, and Bright-See, 1980; Rudge, 1973).

A number of studies are reported in the literature on the validity of methods used to evaluate dietary quality in both the United States and Canada. In the United States, Bowering, Morrison, Lowenberg, and Tirado (1977) and Guthrie and Scheers (1981), on the basis of 24-hour food records, find a highly significant correlation between the number of nutrients meeting two thirds of the Recommended Dietary Allowances and an evaluation based on the consumption of foods recommended in the Basic Four.

In Canada, studies evaluating food consumption on the basis of the RDNI (1964 Canadian Dietary Standard) as compared to the recommendations of the 1961 Canada's Food Guide include those by Milne, Kerr, Trenholme, and Beaton (1963) and McClinton, Milne, and Beaton (1971). These studies indicate that the evaluation of dietary quality according to the RDNI is not congruent with that obtained on the basis of Canada's Food Guide. In an evaluation study using more recently revised standards, Rewko et al. (1980) further verifies that a scoring system based on the 1977 Canada's Food Guide is not an effective indicator of the nutrient intakes recommended in the 1975 Canadian Dietary Standard.

An assessment of eating habits, therefore, requires not only the careful selection of a method to obtain food consumption data but also a dietary standard against which gaps or deficits in eating habits are identified.

2.4 Knowledge-Based Needs Assessment (Assessment of Nutrition Knowledge)

Needs identified on the basis of an assessment of nutrition knowledge are considered to be prescribed needs in the present study. Since it is well recognized that such needs can be satisfied at least in part by learning experiences, they are also considered to be educational needs.

Assessment of nutrition knowledge involves measuring existing knowledge relative to an acceptable standard. In the present study this standard is based upon expert opinion of what mothers ought to know about the basic four food groups. The extent to which they meet this standard is represented by the score they receive on a given nutrition knowledge test.

A review of the literature uncovers a variety of instruments available to assess nutrition knowledge (Baker, 1972; Carver and Lewis, 1979; Eppright, Fox, Fryer, Lamkin, and Vivian, 1970; McCarthy and Sabry, 1973; Sullivan and Schwartz, 1981; Young, Waldner, and Berresford, 1955). However, with the exception of the widely used instrument of Eppright and co-workers (1970), few tools are available to specifically assess the existing knowledge of mothers of preschoolers. Eppright's (1970) instrument, originally designed for a comprehensive study of preschoolers in the North Central Region of the United States, is used by Simms and Morris (1974) in their study of parents and preschoolers and, with some adaptation, by Schwartz (1973) in her study.

Knowledge instruments differ significantly from each other, not only in their focus on a particular target group but also in their

conceptual framework. Such frameworks serve as the standard of what ought to be known within certain content domains by the target group being assessed. Sullivan and Schwartz (1981), for example, use the Nutrition Recommendations for Canadians related to diet and heart disease as their conceptual framework. Carver and Lewis (1979), on the other hand, use concept topics outlined by the Interagency Committee on Nutrition Education. To this researcher's knowledge, however, no suitable instruments are available for mothers of preschoolers based on specific concepts of the Canada's Food Guide per se, a major focus of the present study.

Knowledge instruments also differ in the response formats they use. The two most common formats selected for nutrition knowledge instruments are the essay and objective short answer-type items such as the multiple choice or true-false choice. A popular misconception in selecting a format is that it determines the kind and level of ability which can be tested. For example, true-false items are thought to be limited to testing for simple factual recall. However, as Ebel (1971) is able to demonstrate, complex and difficult problems can also be presented effectively in this form. In the present study the true-false format is used for the knowledge instrument. Some observations related to the advantages and disadvantages of this particular format are addressed below.

True-false items are commonly selected because they are a relatively simple, objective way to measure fundamental knowledge. They are also considered to be quite efficient. An efficient test is one

"that yields a large number of independent scorable responses per unit of time" (Ebel, 1965, p. 25). Efficiency helps to contribute to the quality of a test.

True-false items are relatively easy to prepare due to their simple structure. However, they tend to be more subject to ambiguity and misinterpretation. Ebel (1965) points out that good true-false items may appear ambiguous to novices; they should not, however, appear ambiguous to experts. Care taken to ensure objectivity helps to increase reliability (Weirsma, 1975).

A limiting factor of the true-false format is the high proportion of items that can be answered correctly by chance, and consequently the random error introduced into scores as a result of chance responses or guessing. Adding "uncertain" to the choice of true-false response categories helps to reduce such error. In addition, a scoring procedure based upon a respondent's indication of how much he is guessing, or what is referred to as a confidence-weighted response, is sometimes used to overcome random error, thereby, increasing test reliability (Eppright et al., 1970; Sullivan and Schwartz, 1981).

It is evident from the above discussion that reliability is an important indicator of test quality. Item analysis is one procedure which often helps to reveal reasons for low reliability or internal consistency of an instrument. The procedure reveals information regarding the difficulty of test items and their discriminating power, both of which influence internal consistency reliability.

Item difficulty is generally indicated by the proportion or percentage of respondents who answer an item correctly. "In general, the wider the distribution of item difficulty values in a test, the more restricted the distribution of test scores and the lower the reliability of those scores" (Ebel, 1965, p. 373).

Widely distributed test scores and, therefore, improved reliability are also obtained when test items discriminate well between respondents with good knowledge and those with poor knowledge. The discrimination ability of an item is often represented by a correlation coefficient between a correct item response code and the subtest or total test score (Nelson, 1974; Talmage and Rasher, 1981).

The assessment of knowledge requires that attention be given to a number of important factors. Only those most relevant to the present study are discussed above.

2.5 Perceived Needs Assessment

A method which identifies the perceived or felt needs of a particular target group may be considered as a perceived needs assessment. Contrary to expertly-defined or prescribed needs, felt needs are individually or self-defined. In the present study, felt needs are represented by a scaled response indicating the degree to which mothers of preschoolers feel they need information on certain topics related to the four food groups.

Numerous methods of assessing felt needs are cited in the literature (Beavers and Burris, 1976; Lorig, 1977; MacDonald, 1977; Saraswathi, 1969;

Witkin, 1977). These methods vary greatly ranging from the use of simple hunches to systematic exercises and sophisticated questionnaires. In addition, some methods are conducted collaboratively using a small group of lay leaders representative of a larger target population (Rausch, 1972); others rely upon the individual's perceptions alone. Only methods and procedures directly relevant to the present study are discussed below.

One of the most common methods used to assess perceived needs is the checklist. The checklist by itself can be as simple as listing a number of topics to be checked by the respondent. Lorig (1977) cites this simplicity as one of the disadvantages of the tool in that respondents do not need to give much thought or effort to their participation and do not become involved in the decision-making process.

Riddick, Cordes, and Crawford (1978), however, use the checklist effectively in identifying education needs as perceived by community health decision-makers by making some modifications to the tool in its simplest form. Topics are developed during meetings with professional staff and grouped. Then, for each topic respondents are asked to indicate on a 5-point scale the importance of developing educational materials concerning the topic. For analysis, responses are classed as: important, somewhat important, not too important, and unimportant. An opportunity is also provided to suggest additional topics respondents feel to be important.

Topics for the above method are also prioritized. For example, topics defined as important by more than 60% but less than 75% of the respondents are termed medium priority.

In another study conducted by Lemon (cited in Saraswathi, 1969), educational felt needs are also identified by the use of checklist-type items using a scaled response. The main structure of the questionnaire consists of 10 categories. Within each category there are from 3 to 13 items for a total of 85 items. The respondent can answer each item in one of three ways: very important to know, important to know, or nice to know.

In a study by the Colorado Extension Service (cited in Saraswathi, 1969), felt needs are identified in 11 broad areas. Respondents rank as first and second choice any two alternatives on which they would be interested in receiving advice or information.

One other study of particular interest, cited by Saraswathi (1969) and conducted by Smith, identifies the difficulties recognized by a group of young homemakers and the sources of information they find most helpful. One part of the interview schedule lists questions concerning difficulties in six areas of home-making and the responses are in terms of the degree of difficulty encountered: much difficulty, some difficulty, little or no difficulty, and doesn't apply. The data are analyzed by counting the frequencies of responses according to the degree of difficulty.

2.6 Summary of the Literature

"Need" is neither a simple nor a unitary concept. There is no general consensus in the literature about what needs are or how to measure them. The first section of this chapter discusses the different terms used by authors to describe the concept of need and an attempt is made to clarify these terms as defined in the present study. The importance of being aware of which definitions are being used within a given context is emphasized.

The methods used to assess needs are as numerous and varied as the concept of need itself. The second section of this chapter attempts to place the needs assessment methods of the present study within a broader context. The present study, for example, focusses upon methods of gathering performance and other data on existing conditions. This approach to needs assessment is considered to be only one part of the more comprehensive systems approach of Kaufman (1977).

Keeping in mind the needs assessment approach used in the present study, the remainder of the chapter discusses some of the methodologies related to the identification of specific needs. These include methods based upon an assessment of eating habits, nutrition knowledge, and perceptions. As these methodologies are examined more closely it becomes readily apparent that all have strengths and limitations. Which method(s) are finally selected is dependent upon the kinds of decisions to be made, the purpose of the study, and the resources available to do the job.

CHAPTER 3
METHODS AND PROCEDURES

3.1 Selection of Data Source

The sample for the present study was drawn from a population of mothers complying with the following specific selection criteria:

- (a) Mothers will have a 3 year old child with a birthdate from September 1, 1977 to July 1, 1978 inclusive.
- (b) Mothers will have a child who is not following a therapeutic diet which requires total elimination of one or more food groups and for which no food substitutes are given.
- (c) Mothers will reside in the Regina Rural Region of The Saskatchewan Department of Health at the time of the study.
- (d) Mothers will work part-time, casual, or on a seasonal basis or not work outside the home at all.
- (e) At the time of the data collection, mothers will have been responsible for the supervision of their child for at least the previous week and be fully aware of their child's daily dietary intake, thus qualifying them as "at-home" mothers.

This last criterion was felt to be necessary in order to reduce the occurrence of extraneous variables which might be associated with the reporting of food intake by a variety of different individuals (babysitter, father, grandparent etc). Furthermore, any relationship found to exist between mothers' perceptions of need and need based on their childrens' food intake would otherwise be distorted, especially in those cases where children ate away from home when their mothers worked.

Any random sample drawn from a population within the Regina Rural Region, one of 10 provincial health regions in Saskatchewan, is expected to consist of subjects who are primarily rural, white, and of middle socioeconomic status. Although there are approximately 5,000 registered Indians in the Region, only those living in the local communities (not on the reserves) and, therefore, under the jurisdictional responsibility of the health region are considered (Community Profiles, 1981).

Approximately one half the population of the region resides in rural municipalities, the remainder living in towns and villages according to 1976 Census Canada population figures. The largest town has a population of about 2,500.

The Regina Rural population also encompasses 18 nursing districts with one nurse responsible for each district. The nurse maintains records of families with preschool children in her district including information on the name, birthdate, and residence of each preschooler. She also possesses knowledge of the employment status of most mothers of preschoolers in the region.

With the assistance of the public health nurses, therefore, the researcher identified 776 mothers with three year old children who resided within the health region. Of the 776 mothers, 618 or 79.6% were further identified as not working outside the home or working part-time, casual, or seasonal jobs. It was felt that this latter group of mothers had the greatest chance of qualifying as at-home mothers, and it was from this population, therefore, that a random sample of 62 mothers was initially selected for the study.

The initial selection of 62 mothers represented an oversample of about 20% to ensure a final sample size of at least 50. This sample size was felt to be sufficiently large to be representative of the population from which it was drawn yet manageable in terms of the practical constraints of the study: cost, time, and personnel.

To ensure that all parts of the region were represented and because of the natural division of the region into districts, the random sample was proportionately allocated over the 18 nursing districts. Details regarding the distribution of mothers required from each nursing district may be found in Appendix A.

Once the sample was selected, 62 mothers were contacted and appointments were made to see them. Prior to data collection, four mothers cancelled their appointments: three due to an unexpected early harvest; one due to a very ill child. Data were, therefore, collected from 58 mothers. Of these mothers, 4 did not meet all the selection criteria: 1 mother had a child with an allergy diet which required total elimination of certain food groups; 3 mothers were away

from home during the week prior to data collection and, therefore, were not considered to be at-home mothers for purposes of the present study. Complete and usable data were available, therefore, from 54 mothers.

3.2 Data Collection Instruments

Data collection instruments were adapted or developed for each of the three methods of needs assessment under study.

3.2.1 Food Consumption-Based Needs Assessment

This method of assessment involved a comparison of existing food consumption of preschoolers with Canada's Food Guide (1977) as the standard in order to identify gaps or deficits in their eating habits.

A frequency of food intake-type instrument using a 3-day recall was selected to obtain a qualitative estimate of the food consumption of preschoolers. This instrument (Appendix B) was originally developed and tested by Rudge (1973) and was used in a study of Ohio high school graduates by Schwartz (1973).

The first section of the instrument listed food categories related to the four food groups as well as portion sizes for each category. Minor revisions were made to this section, without threat to content validity. This allowed the researcher to make the portion sizes more adaptable to the preschool population and the food categories, 16 in total, more reflective of updated food composition values (Nutrient Value of Some Common Foods, 1979).

The second part of the instrument was completely revised to include a list of food categories considered as "other" foods and questions about special diets, vitamin-mineral supplementation, breakfast consumption, among others. Data collected from this section were not analyzed as part of the present study.

The use of the food frequency instrument involved asking mothers to recall what their preschoolers ate and drank in the past 3 days. Plastic dishes including a glass, a fruit nappie and a cereal bowl were used to help mothers estimate the quantities of food their preschoolers consumed. Meat portions were estimated by having mothers depict the amount consumed with their hands.

Reported quantities for each of the 16 food categories listed in the first section were then translated by the researcher into frequencies of intake over the past 3 days. This involved comparing the quantities with predetermined portion sizes. This procedure for obtaining the frequencies of various foods consumed was felt to be justified in view of the large variability in the portion sizes eaten by 3 year old children.

Mothers' ability to recall foods their preschoolers consumed was successfully facilitated by having them work their way back one day at a time starting with the most recent meal or snack consumed in the past 3 days. Recalling foods consumed at main meals often helped mothers remember smaller meals and snacks which were eaten. Thinking of major activities of the past 3 days also served as a helpful reminder of foods consumed.

Data were collected each week on Thursdays, Fridays, and Saturdays in order to obtain information regarding food consumed on week days only. This was done in an attempt to reduce the variability that otherwise was expected to arise due to differences in eating patterns between weekdays and weekends (Chalmers, Clayton, Gates, and Tucker, 1952; Eppright et al., 1952).

In addition to the food frequency instrument, the associated scoring system developed by Rudge (1973) was also adapted for the present study (Appendix C). Minor revisions were made to the scoring system including those to reflect recommendations of Canada's Food Guide (1977) as opposed to the Basic Four of the United States.

The frequencies of intake for the 16 food categories were coded with numerical scores derived from the revised scoring system referred to above. These scores contributed to one of four food group scores depending upon which of the four food groups of Canada's Food Guide the 16 food categories belonged. A given food group score represented a quantitative estimate of the eating habits of a preschooler in relation to that particular food group. Each food group was assigned a maximum possible score of six points indicating a total compliance with Canada's Food Guide and consequently a lack of deficits or gaps in eating habits.

The instrument as revised and described above was felt to be the best suited for the purposes and resources of the present study. Characteristics of this instrument which were found to be

most desirable included: its demonstrated content validity, its capacity to collect food consumption data during a single home interview within a maximum of 30 minutes, its capacity to obtain qualitative estimates of the amount of food consumed by preschoolers as reported by their mothers, its capacity to collect data for analysis at the individual level, and its compatibility with a scoring system which was able to produce quantitative estimates of the food consumption of preschoolers in relation to the four food groups.

3.2.2 Knowledge-Based Needs Assessment

A nutrition knowledge test (Appendix B) consisting of true and false items was developed after a failure to locate any instruments suitable for assessing mothers' knowledge of the four food groups of Canada's Food Guide.

In the first step in the development of the test, Saskatchewan nutritionists were asked by the researcher to list ideas or concepts they felt should be included as part of the content or message(s) of a nutrition education program for mothers of preschoolers in relation to each of the four food groups of Canada's Food Guide (Appendix D). Their recommendations together with those found in Canada's Food Guide Handbook (1977) served as the conceptual framework (Table 1) for the knowledge test and the standard against which mothers' knowledge was assessed. The four food groups of Canada's Food Guide served as the content domains. Item construction

and scoring procedures for each content domain followed the guidelines suggested by Ebel (1965, 1971).

Table 1
Conceptual Framework for Nutrition
Knowledge and Perception Instruments

-
1. Foods with similar nutritional value are classified into the same food group.
 2. Each food group includes a variety of food choices ranging widely in cost, digestibility, flavor, caloric content, and availability.
 3. All individuals need food from each of the basic groups daily but in varying amounts depending on age, sex, activity, and state of health.
 4. Each food group has its own key nutrient "strengths".
 5. Each food group has its own particular uses in the body.
 6. All nutrients needed by the body are available through food.
 7. The way food is handled influences its food value, safety, appearance, and taste.
-

The first draft of the knowledge test consisted of 40 true and false items. It was administered to a group of 16 nurses during a nursing staff conference in the Regina Rural Region. In addition, 10 out of 12 nutritionists responded on an individual

basis to a request to help validate the instrument by reading each of the 40 items and crossing out any item if they disagreed with the true or false response provided in the key (Appendix D). Both groups were also asked to make comments concerning awkwardness or ambiguity of any particular item. Two experts from the faculties of Education and Home Economics also provided suggestions regarding ambiguous items.

The above procedures helped the researcher to evaluate the quality of the test in terms of its objectivity (Ebel, 1965). Although none of the nutritionists disagreed with the keyed responses, their comments as well as those from the nurses and faculty members led to the revision of 17 items and the deletion of 8 others to reduce ambiguity. This resulted in a second draft of the instrument with 32 items.

The second draft of the knowledge test was administered on an individual basis to 50 mothers of preschoolers in the Moose Jaw Health Region over a 3-day period. The responses by 30 of the mothers, who had preschoolers most similar in age to those in the present study, were subjected to an item analyses by computer (Nelson, 1974). This resulted in difficulty and discrimination indices for each item. In addition to the item analyses by computer, each item was logically examined by the two faculty members mentioned previously for further ambiguities or awkwardness as well as relevance of items to their content domains.

Experts agreed that items were relevant. However, further item modifications and deletions were made to reduce remaining ambiguities judged by the experts to exist. In addition, results of the computerized item analyses were helpful in making further revisions. In general, items with low discrimination indices and difficulty indices with values lower than 0.5 or greater than 0.8 were changed or deleted. However, in a few instances items which were found to be more difficult (i.e., possessing indices of less than .25) yet unambiguous were retained. These items were felt to be highly significant in terms of their content validity and, thus, the insight they offered for programming.

In its final form, the knowledge test consisted of 24 items distributed equally among the four content domains with a balance between true and false items. Mothers were asked to respond to each item by indicating whether the statement was: true, false or uncertain. An uncertain category was added to reduce the source of error due to guessing. A correct response, whether true or false, was assigned one point; incorrect or uncertain responses received no points. A maximum possible subtest score of 6 points, therefore, indicated a "perfect knowledge" of one of the basic four food groups and, thus, a lack of need for nutrition education of that particular group.

3.2.3 Perceived Needs Assessment

A questionnaire was developed to collect data regarding mothers' perceptions and practices (Appendix B). Data from the

first section of the questionnaire were primarily used for the present study; data from other sections were used for purposes of a related project.

In the first section mothers were asked to indicate the degree to which they felt they needed information on a number of listed topics. These topics were developed according to the same conceptual framework as were the knowledge items. Similarly, the four food groups of Canada's Food Guide served as the content domains. Construction of the questionnaire followed the guidelines offered by Weirsma (1975) and Woodward and Chambers (1980).

A preliminary draft of the questionnaire was sent to seven nutritionists for their review. In relation to the first section, they were asked to comment on the relevance of each of the 20 topics to their respective content domains as well as on the overall comprehensiveness of the topics (Appendix D). This draft was also administered to six mothers of preschoolers in the Regina Rural Region who were not part of the selected sample for the study.

The comments and suggestions received from six out of the seven nutritionists and the six mothers were used to revise the questionnaire primarily in terms of the wording of particular topics in order to clarify their meaning. No additional topics were felt to be required by the nutritionists. Similarly, no topics were deleted.

The revised first section of the questionnaire, therefore, included 20 topics distributed over 4 content domains. The response system was a 4-point scale which served as an indicator of the degree of need for information on each topic. This scale represented a response continuum ranging from 1 for no need to 4 for high need. When scoring, the scaled response for each topic was first coded in the reverse order. This coded score was then added to the others within the same content domain (subtest). The maximum possible subtest score was 20, indicating no felt need for information in relation to that particular content domain or food group.

This method of perceived needs assessment was selected because it represented a common method of assessing felt needs at the local level. In addition, it was relatively easy to incorporate as part of a larger questionnaire and it was administered successfully within a 10 to 15 minute period.

Apart from the instruments adapted or developed to collect data regarding eating habits, knowledge, and perceptions; questions were also designed to gather demographic data. Such data, needed in order to more fully describe the sample, consisted of the following variables: marital status, age of mother, education, employment, number of children, their ages, sex of preschooler under study, and location of residence.

3.3 Pretesting Interview Schedule

Once each data collection instrument was adapted or developed and tested individually, it was then pretested as part of an overall interview schedule. Five mothers who were not part of the selected sample but who had preschoolers in the Regina Rural Region were administered the schedule and were asked to provide any suggestions or comments they had for improving it.

In general, relatively minor revisions were made to the schedule based on pretest results. The most significant changes included the addition of the "special diet" criterion for sample selection; the use of plastic dishes to estimate the amounts of food consumed; and converting the 4-point scale of the perception instrument to a 5-point scale, thereby, better defining the mid-point of the continuum. As a result of this latter change the total maximum possible subtest score increased from 20 to 25.

3.4 Procedures for Data Collection

A home interview of approximately one and one half hours was conducted with each mother of the selected sample using the pretested interview schedule. The home interview was felt to provide the most complete information with minimal disruption to family routine.

The different instruments were consistently administered in the same order during the interview: beginning with the collection of data concerning eating habits, followed by felt needs, then knowledge, and ending with questions related to demographic variables. This sequence was felt to provide the most valid data by minimizing

"instrument effects" such as increased awareness and learning on responses given.

Mothers selected to participate in the study were contacted by telephone to arrange an appointment prior to the interview. They were informed that a study of three year old children was being conducted by the researcher over the summer months by interviewing mothers in their homes throughout the Health Region. The purpose, they were told, was to obtain more information from mothers themselves about the needs they have related to feeding their children. It was explained that this information would assist the Health Department by giving it more direction as to programs and resources mothers would find most useful. Care was taken not to alert mothers to details of the study in order to prevent them from making deliberate changes to their preschoolers food consumption prior to the interviews. All interviews were conducted by the researcher from July 16 to September 3, 1981 inclusive.

3.5 Data Analysis

Data collected for the study were coded, key punched, and analyzed with the computer assistance of Saskatchewan Computer Utility.

Analysis of data from the interview schedule as a whole included tabulations of frequencies to provide descriptive information about the characteristics of the sample being studied. Data analysis also included the use of the Pearson product-moment correlation coefficient to determine the relationships between

(a) mothers' perceived needs and needs based on their nutrition knowledge and (b) mothers' perceived needs and needs based on the food intake of their preschoolers for each of the four food groups.

Rejection of the null hypothesis resulted if a relationship was found to be statistically significant at the .05 level. However, in an attempt to interpret the substantive importance of a given relationship, the following guidelines provided by Van Dalen (cited in Weirsma, 1975) were used:

| <u>Value of r</u> | <u>Interpretation</u> |
|-------------------------------|--------------------------------|
| <u>+</u> .00 to <u>+</u> .20 | negligible relationship |
| <u>+</u> .20 to <u>+</u> .40 | low relationship |
| <u>+</u> .40 to <u>+</u> .70 | marked relationship |
| <u>+</u> .70 to <u>+</u> 1.00 | high to very high relationship |

These guidelines were selected somewhat arbitrarily to reflect the researcher's interpretation of the results. Others may wish to select different levels to guide them in their interpretation.

The Pearson product-moment correlation coefficient was selected because it "does not waste information and is more sensitive to an existing relationship under appropriate conditions" (Weirsma, 1975, p. 306). However, in order to use the coefficient, three assumptions about the population distributions were necessary. These included:

- (a) that the distributions of the two variables under study be continuous and somewhat symmetrical. Weirsma (1975) points out that although the distributions do not have to be normal they should be unimodal.

- (b) that a linear relation (one that approximates a straight-line fit) exists between the two variables as indicated on a scattergram.
- (c) that the distributions of the two variables have about the same variability.

CHAPTER 4

ANALYSIS of DATA

In this study the relationships among three methods of needs assessment were explored using a randomly selected sample of at-home mothers of preschoolers in the Regina Rural Health Region. Analysis of data involved correlating mothers' perception scores with scores based on their nutrition knowledge and on the food consumption of their preschoolers for each of the four food groups. These scores are presented in Appendix E. Tabulations of frequencies to provide descriptive information about the characteristics of the sample being studied were also included in the analysis.

4.1 Description of the Participants

Complete and usable data were available from a total of 54 mothers for analysis. Table 2 presents a description of selected characteristics of the sample. The mean age of the 54 mothers was 28 years with a range varying from 21 to 41 years. All were married or living with a partner at the time of the study. The majority (81%) were working

Table 2

Description of Mothers and Their Children by
Selected Characteristics

| Characteristics | Descriptive Statistics | |
|--|------------------------|------------------|
| | Number | Percentage |
| Education of Mothers | | |
| Some High School | 8 | 15 |
| Completed High School | 21 | 39 |
| Some Vocational/Technical | 6 | 11 |
| Completed Vocational/Technical | 10 | 19 |
| Some University | 6 | 11 |
| Completed University | 3 | 6 |
| Total | 54 | 101 ^a |
| Employment of Mothers | | |
| Homemaker | 44 | 81 |
| Part-Time Employment | 10 | 19 |
| Total | 54 | 100 |
| Place of Residence of Mothers | | |
| Farm | 27 | 50 |
| Town | 27 | 50 |
| Total | 54 | 100 |
| Mothers With Children in Specified Age Groups | | |
| With Children | | |
| Under 12 months and no children over 60 months | 8 | 15 |
| 12 months to 60 months only | 14 | 26 |
| Over 60 months | 32 | 59 |
| Total | 54 | 100 |
| Sex of Preschooler Under Study | | |
| Male | 22 | 41 |
| Female | 32 | 59 |
| Total | 54 | 100 |

^aDoes not equal 100% due to rounding errors.

as full-time homemakers; the remainder classified as employed on a casual or part-time basis. All mothers possessed, at least some high school education with the majority (86%) completing their high school or some form of post-secondary education. A university degree was completed by about 6%. The distribution of this sample of mothers in terms of their place of residence was similar to the population from which it was drawn with 50% living on farms and 50% living in towns.

Of the children under study, a larger percentage (59%) were females. The mean number of total children per family was 2.6 with individual families having from one to ten children. Over half (59%) of the mothers, in addition to the child under study, also had at least one child in school. Another 15% had an infant less than 12 months old but no school age children. The remainder (26%) of mothers had one or more children between 12 and 60 months only. These latter mothers represent a group with, generally, the least regular exposure to public health personnel.

4.2 Description of the Results Related to Perception, Knowledge, and Food Consumption Scores

Table 3 indicates the distribution of perception scores ranging from 7 to 25 for each of the four food groups. Each food group had 5 topics; each topic was scored from 1 to 5 for a maximum possible subtest score of 25. As subtest scores decreased from the maximum an increasing need for nutrition education was indicated. Scores for each of the four food groups had a similar distribution with about one-third of scores

concentrated at the lower end of the distribution (classes 1 to 3 inclusive). An exception was the meat and alternates group which had a slightly greater concentration of scores (39%) in this range. Mean scores for each of the four food groups were also similar ranging from 16.0 to 17.7.

Table 3
Percentage Distribution of Mothers' Perception
Scores for Each of the Four Food Groups

| Class | Perception Score Class Boundaries | Food Groups | | | |
|-------------------|--------------------------------------|--|-------------------------------------|---------------------------------------|------------------------------------|
| | | Milk and Milk Products ^a | Meat and Alternates ^a | Fruits and Vegetables ^a | Breads and Cereals ^a |
| 1 | 6 - 8 | 7 | 0 | 2 | 2 |
| 2 | 9 - 11 | 6 | 22 | 9 | 6 |
| 3 | 12 - 14 | 15 | 17 | 19 | 22 |
| 4 | 15 - 17 | 22 | 20 | 19 | 26 |
| 5 | 18 - 20 | 17 | 28 | 19 | 26 |
| 6 | 21 - 23 | 22 | 6 | 22 | 13 |
| 7 | 24 - 26 | 11 | 7 | 11 | 6 |
| Total Percentages | | 100 | 100 | 101 ^b | 101 ^b |
| Mean | | 17.6 | 16.0 | 17.7 | 16.8 |
| S.D. | | 5.0 | 4.5 | 4.7 | 3.9 |

Note. Maximum score = 25.

^an=54 subjects for each food group.

^bDoes not equal 100% due to rounding errors.

Table 4 indicates the distribution of knowledge scores ranging from 0 to 6 for each of the four food group subtests. A correct response to all knowledge statements related to a particular food group resulted in

a maximum possible subtest score of 6 indicating a lack of need for that group. As subtest scores decreased from this maximum an increasing need for nutrition education was indicated. An inspection of Table 4 shows that the greatest percentage of low knowledge scores (classes 1 to 3 inclusive) occurred in the milk and milk products subtest (58%), followed by breads and cereals (37%), then meat and alternates (16%), and finally fruits and vegetables (11%). Furthermore, the milk and milk products group was the only group found to have no scores as high as 6 (class 7). On the other hand, the fruit and vegetable group was the only group found to have no scores lower than 2 (class 3).

Table 4
Percentage Distribution of Mothers' Nutrition Knowledge
Scores for Each of the Four Food Group Subtests

| Class | Knowledge Score | Subtests | | | |
|-------------------|-----------------|-------------------------------------|----------------------------------|------------------------------------|---------------------------------|
| | | Milk and Milk Products ^a | Meat and Alternates ^a | Fruits and Vegetables ^a | Breads and Cereals ^a |
| 1 | 0 | 6 | 0 | 0 | 2 |
| 2 | 1 | 20 | 9 | 0 | 13 |
| 3 | 2 | 32 | 7 | 11 | 22 |
| 4 | 3 | 22 | 15 | 20 | 22 |
| 5 | 4 | 11 | 28 | 33 | 17 |
| 6 | 5 | 9 | 28 | 24 | 19 |
| 7 | 6 | 0 | 13 | 11 | 6 |
| Total Percentages | | 100 | 100 | 99 ^b | 101 ^b |
| Mean | | 2.4 | 4.0 | 4.0 | 3.2 |
| S.D. | | 1.3 | 1.5 | 1.2 | 1.5 |

Note. Maximum score = 6.

^a_n = 54 subjects for each subtest.

^bDoes not equal 100% due to rounding errors.

The distribution of food consumption scores ranging from 1 to 6 for each food group are shown in Table 5. A maximum food group score of 6 indicated total compliance with Canada's Food Guide. As food group scores decreased from this maximum an increasing need for nutrition education was indicated. Less than a quarter of the scores for any one food group were concentrated in the lower end of the distributions (classes 1 to 3 inclusive): the greatest concentration for this category occurring is the milk and milk products group (24.1%), followed by meat and alternates (16.7%), fruit and vegetables (11.2%), and breads and cereals (0%). In fact, no scores less than 5 were found for breads and cereals.

Table 5
Percentage Distribution of Preschoolers' Food Consumption
Scores for Each of the Four Food Groups

| Class | Food Consumption Class Boundaries | Food Groups | | | |
|-------------------|--------------------------------------|--|-------------------------------------|---------------------------------------|------------------------------------|
| | | Milk and Milk Products ^a | Meat and Alternates ^a | Fruits and Vegetables ^a | Breads and Cereals ^a |
| 1 | .6 - 1.5 | 4 | 0 | 4 | 0 |
| 2 | 1.6 - 2.5 | 4 | 6 | 2 | 0 |
| 3 | 2.6 - 3.5 | 17 | 11 | 6 | 0 |
| 4 | 3.6 - 4.5 | 15 | 15 | 20 | 0 |
| 5 | 4.6 - 5.5 | 15 | 17 | 26 | 9 |
| 6 | 5.6 - 6.5 | 46 | 52 | 43 | 90 |
| Total Percentages | | 101 ^b | 101 ^b | 101 ^b | 99 ^b |
| Mean | | 4.9 | 5.0 | 4.9 | 5.9 |
| S.D. | | 1.4 | 1.3 | 1.2 | .3 |

Note. Maximum score = 6.

^a_n = 54 subjects for each food group.

^bDoes not equal 100% due to rounding errors.

4.3 Findings Related to the Hypotheses

Using the Pearson product-moment correlation coefficient, the hypotheses of the study were tested: relating mothers' perceived or felt needs to needs based on their nutrition knowledge, and mothers' perceived needs to needs based on the food consumption of their preschoolers for each of the four food groups.

The findings, given in Table 6, indicated that mothers' perception scores were not significantly correlated with their knowledge scores for each of the four food groups. There were also no significant correlations between mothers' perception scores and the food consumption scores of their preschoolers for each of the food groups with the exception of the fruit and vegetable group. In this latter case, a statistically significant relationship ($p < .05$) was found between mothers' perception scores for the fruit and vegetable group and their preschoolers' food consumption scores for fruit and vegetables. The non-significant correlations found for the data in all but one instance, however, were not able to support the existence of relationships among the three methods of needs assessment tested.

Table 6
 Correlation Coefficients Between Perception Scores and
 Knowledge Scores and Perception Scores and Food Consumption Scores
 for Each of the Four Food Groups

| Correlations Between | Food Groups | | | |
|-------------------------|---------------------------|------------------------|--------------------------|-----------------------|
| | Milk and Milk Products | Meat and Alternates | Fruits and Vegetables | Breads and Cereals |
| P-K | 0.232 | 0.239 | 0.235 | 0.168 |
| P-FC | -0.110 | -0.046 | 0.276* | 0.150 |

Note. P - Perceived or felt needs.

K - Knowledge-based needs.

FC - Food Consumption-based needs.

*p < .05

CHAPTER 5

DISCUSSION AND SUMMARY

5.1 Conclusions, Interpretation, and Application

The findings of this study indicated a consistent trend, sustaining the null hypotheses that there are no relationships between educational needs identified as felt needs and those identified to be prescribed needs based on either an assessment of at-home mothers' nutrition knowledge or an assessment of their preschoolers' food intake in relation to the four food groups.

The only exception to the findings was the statistically significant relationship shown to exist between mothers' felt needs related to the fruit and vegetable group and needs based on their preschoolers' intake of fruits and vegetables. A possible explanation for this after more closely examining perception and food consumption scores (Appendix E), may be the greater awareness on the part of some mothers of the adequacy of their preschoolers' intake of fruits and vegetables as opposed to other food groups. This greater awareness may reflect the "age-old" and universal problem parents have of getting their children to eat vegetables

and, consequently, the greater publicity and attention generally given to this problem compared to problems associated with other food groups.

While still considering this single exception to the findings, it is interesting to speculate that mothers' perceptions may have been more highly correlated with their preschoolers' intake of the fruit and vegetable group had the study been conducted during a different season of the year. During the winter season, for example, the availability of fresh produce (particularly raw garden vegetables) is limited; often resulting in lower fruit and vegetable consumption as was found among preschoolers in the Nutrition Canada Survey (Nutrition Canada Food Consumption Patterns Report, 1973).

In view of the actual findings of the present study, however, the above interpretations must be exercised with caution. Although the relationship found to exist was statistically significant, it was considered to be low (using Van Dalen's classification) in terms of any substantive importance (Weirisma, 1975).

The findings of this research, therefore, support those of Hiemstra and Long (1974) who also found no relationship between felt needs and those demonstrated by physical therapists to be real needs (prescribed needs). It is evident from these findings that some major differences exist between felt and prescribed needs. A separate consideration of each of the three methods investigated in the present research may help to further illustrate some of these differences.

If the need for nutrition education is considered to increase as scores decrease, then based on the perceived needs assessment method

about one third of the sample had high felt needs (i.e., scores in classes 1 to 3 inclusive); and this was found to be a consistent trend among all food groups (Table 3, p. 52). On the other hand, based on an assessment of knowledge, over half the sample was found to have high prescribed needs for the milk and milk products group but this dropped to about one third for breads and cereals, and significantly less for the other food groups (Table 4, p. 53). Based on an assessment of food consumption, another method of assessing prescribed needs, those found to have high needs varied from less than one quarter of the sample for the milk and milk products group to none for breads and cereals (Table 5, p. 54). These demonstrated differences between felt and prescribed needs support the conclusion that to plan a program around only a perception of need might prove inefficient and ineffective.

From a practical point of view such findings leave the program planner confronted with the task of considering more than one indicator of need or using needs based on more than one method of assessment. Which combination of assessed needs the planner decides to use may be facilitated by keeping in mind the strengths and limitations of the methods from which the assessed needs are derived. For example, by considering mothers' felt needs, the program planner obtains valuable information about the areas regarded by mothers as interesting, relevant, and/or required in order to feed their families a healthy diet. However, since mothers' abilities to accurately assess needs are limited by their perceptions, some of the felt needs they identify may be distorted while certain important prescribed needs may not be identified at all.

In contrast to the felt needs described above, prescribed needs are generally considered to be a more accurate assessment of needs. Such needs, in the context of the present research, were assessed on the basis of mothers' knowledge and the food consumption of their children. The relative worth of needs based on these two methods themselves, however, could be questioned by the program planner. The apparent differences, previously observed, between prescribed needs based on an assessment of knowledge and those based on an assessment of food consumption seem to suggest neither method is adequate by itself as a basis for program planning. However, this proposition remains tentative since the relationship between these two methods was not investigated. Nevertheless, programs based solely on prescribed needs (regardless of the method(s) used to assess them) also have limitations in that they have the potential of carrying with them less motivation for learning (Knox, 1968).

In view of these considerations, the use of some combination of felt and prescribed needs seems to be a reasonable compromise toward developing more successful programs. In terms of the present research, the most appropriate course of action suggests that needs assessed on the basis of all three methods be considered in addition to other relevant factors. Although this may result in a greater initial expenditure of resources, the benefits of successfully meeting the needs of a particular target audience are likely to outweigh the additional costs.

What emphasis is given to any particular set of needs and which combination of felt and prescribed needs are in fact used as a basis for program planning are dependent on the overall purpose of the program,

the mandate of the organization, and the availability of resources. If, for example, "public" acceptance and learner motivation are primary concerns to an organization, the planner may emphasize needs based on mothers' perceptions considering other assessed needs to a lesser extent. On the other hand, if the adequacy of food consumption is considered to be the "bottom line" in relation to programming, needs assessed on this basis may receive more attention than perceptions. Consequently, if food consumption is adequate, limited funding may dictate that resources be placed elsewhere. Needs assessed on the basis of knowledge may be yet another focus regardless of adequacy of food consumption (often culturally based), especially in those agencies where education of clients is recognized as a valuable asset for making wise food choices in a rapidly changing world.

In addition to the above considerations, the relative magnitude of each set of needs also helps the planner make valuable decisions about program emphasis. For example, the moderate needs of mothers for nutrition information compared to relatively low needs based on the adequate consumption of their preschool children may suggest an interest in nutrition and/or anxiety about their preschool children's food consumption. Other indicators (although beyond the scope of the present research), such as the overuse of vitamin-mineral supplementation and the general concern of mothers that their children are dawdling and eating too little food, provide further evidence of the anxiety mothers feel in relation to their children's eating habits. Programming which increases mothers' understanding of what constitutes normal eating behavior and adequate food consumption at this age may help to alleviate some of their anxieties.

Similarly, mothers' moderately felt needs for nutrition information on some topics compared to their relatively high needs based on their knowledge of these topics suggests a lack of awareness of what they don't know. It also suggests the possibility that they feel certain topics are irrelevant or of little interest. On the other hand, mothers' moderately felt needs for nutrition information on other topics compared to their relatively low needs based on their knowledge of those topics suggests a lack of awareness of what they do know or an interest in those topics.

Mothers' lack of awareness of what they know or don't know is initially surprising in a well-educated population with, supposedly, greater access to information and greater skills to assimilate it. Nevertheless, it cannot be assumed that such characteristics necessarily result in greater nutritional awareness, as the present findings suggest. In fact, it may be possible that the greater amount of information assimilated by these mothers (much of which is likely to be contradictory and confusing) contributes, at least in part, to a distorted perception of what they feel they need. Some programming which increases mothers' awareness of nutrition concepts related to Canada's Food Guide and which attempts to change attitudes may help to clarify misconceptions and make certain issues more relevant.

5.2 Limitations of the Research

Any interpretation of the findings requires that certain limitations of the research be taken into consideration. A major assumption of the

present research was that maternal reporting of preschool children's eating habits was a valid method of obtaining food consumption data. Most documented studies investigating the food consumption of preschool children make this assumption. However, with the exception of Glovsky's (1977) research which indicated that mothers of middle to upper class background have a good working knowledge of their children's food preferences, little research is available to support such an assumption.

Emmons and Hayes (1973) and Owen et al. (1974) suggested that working mothers, or those away from their children a portion of each day, may not know what their children consumed. In the present study, data were obtained from at-home mothers only. Nevertheless, it should be recognized that the findings related to food consumption were based on mothers' reports, not necessarily on the actual food consumption of their children.

Other assumptions made in the present study were those related to the use of the Pearson product-moment correlation coefficient cited on page 47. An examination of children's food consumption scores indicated a skewed distribution for each of the four food groups. The nature of the scoring system, which assigned a maximum food group score of six regardless of the number of servings consumed beyond the minimum recommendations of Canada's Food Guide (1977), was the major reason for the distributions being skewed. This tendency was particularly predominant in the bread and cereals group where the majority (90%) of reported food intakes met or exceeded the minimum recommendations.

The correlation of a variable possessing a skewed distribution with one more normally distributed raises questions concerning the validity of using the Pearson product-moment correlation coefficient. Weirsmas (1975) indicates that in order to use the coefficient, distributions do not have to be normal. However, the researcher should be aware that, "If one of the distributions is skewed, that is, not symmetrical, it will tend to lower the correlation coefficient" (Weirsmas, 1975, p. 292). This suggests that the coefficients reflecting the relationships between perception scores and food consumption scores for each of the food groups in the present research, may, in fact, be higher than indicated and, perhaps, high enough to be statistically significant. Nevertheless, it is doubtful that the coefficients would be of such magnitude that relationships of any substantive importance (using Van Dalen's classification) would be found.

Home interviews were also recognized as having limitations. For example, the increased likelihood of "social desirability" bias was recognized as a potential difficulty in conducting face-to-face interviews. In the context of the present research, however, the presence of a nutritionist as an interviewer was not felt to unduly affect the accuracy of responses given by mothers. Such evidence was indicated by the frankness of mothers in revealing the many other foods (primarily sweets) consumed by their preschoolers and not recognized as part of Canada's Food Guide. In addition, there appeared to be frequent correspondence between mothers' reports of their children's food consumption and observations by the researcher of children's actual eating behaviors during the interviews.

Another limitation of the research was the extent to which findings could be generalized while maintaining their interpretability. For example, in order to make the findings more interpretable, the selection criterion of at-home mothers was used. This limited the generalization of the findings to at-home mothers only. The sample was randomly selected from a relatively homogeneous population (in terms of cultural background, residence, and lifestyle), and proportionately allocated over the 18 nursing districts in the Regina Rural Health Region. It was, therefore, felt that findings could at least be generalized to all at-home mothers in the Regina Rural Health Region, and probably to at-home mothers with similar characteristics in other health regions of Saskatchewan as well. On the other hand, findings could not be generalized to mothers who worked full-time and whose children's food consumption could potentially reveal a somewhat different pattern of eating. However, it was felt that within the Regina Rural Health Region this limitation introduced little bias into the findings since 79.6% of mothers with three year old children were at-home mothers.

5.3 Recommendations for Future Research

- (a) Research is required to more thoroughly test the three methods of needs assessment explored. The limited availability of instruments to collect data related to perceptions, knowledge, and food consumption required that the researcher adapt and/or develop instruments for this purpose within a restricted timeframe.

- (b) A major assumption of the present study was that maternal reporting of preschoolers' eating habits was a valid method of obtaining food consumption data. However, more definitive studies are required to adequately substantiate such an assumption.
- (c) Validation of perceived needs assessment methods should continue to be studied. However, a better understanding of the nature of the relationship between perceived needs and other related factors is first required. Here several questions arise: Is there a significant difference in felt needs as related to age, educational level, employment status, level of "awareness" (e.g., number and type of nutrition courses taken), who assesses the needs (e.g., professional versus client), size of community, among other variables.
- (d) Further research to determine whether different definitions of felt need actually result in different assessed needs is required to gain a better understanding of felt needs themselves. For example, the proposition put forth by Scissons (1980) that "what you define is what you get" could be investigated further.
- (e) Research could also be conducted to determine whether different perceived needs assessment methods result in different assessed needs.
- (f) Prescribed needs based on preschool children's consumption of each of the four food groups were determined in relation to the minimum recommendations of Canada's Food Guide. A maximum food group score of six indicated a consumption which met the

minimum recommendations. Excess consumption beyond the minimum was also assigned a food group score of six. The development of a simple scoring system which could not only adequately reflect deficient but also excessive consumption of each of the food groups of Canada's Food Guide is required. The proposition that such a scoring system would possibly uncover somewhat different prescribed needs (based on food consumption) than those of the present study requires further investigation.

5.4 Summary

Researchers concur that needs assessment is an important component of program planning and decision-making processes. However, the literature provides little information about the relative worth of various methods used to assess educational needs and, particularly, nutrition education needs.

This study, conducted under the auspices of Saskatchewan Health in conjunction with a Community Services Branch project, was designed to investigate the relationship between three methods of assessing nutrition education needs: comparing a perceived needs assessment method with two alternate methods based on assessments of knowledge and food consumption. The four food groups of Canada's Food Guide were used as the basis of comparison between the methods.

Participants selected for the study consisted of a random sample of 58 mothers of preschoolers with birthdates from September 1, 1977 to July 1,

1978 inclusive, a group felt by Saskatchewan Health to require more concentrated effort in terms of programming. Residing in one of 18 nursing districts in the Regina Rural Health Region, the mothers were required to be responsible for the supervision of their child for at least one week prior to data collection and to be fully aware of their child's daily dietary intake, thus, qualifying them as at-home mothers. In order to meet this criterion, the sample was selected from a population of mothers who worked on a part-time, casual, or seasonal basis, or who did not work outside the home at all. This population represented 618 or 79.6% of all mothers identified as having three year old children in the Region.

Home interviews of one and one half hours were conducted by the researcher with each participant. Instruments used during the interviews were developed or adapted to collect data concerning food intake, knowledge, perceived needs, and demographic variables.

An assessment of food intake, resulting in what is referred to as prescribed needs in the present study, involved comparing existing food consumption with the four food groups of Canada's Food Guide (1977). An instrument using a 3-day recall was adapted to obtain the frequency of intake of 16 food categories each belonging to one of the four food groups. Frequencies were then coded according to a scoring system based on Canada's Food Guide resulting in four food group scores for each individual. An assessment of nutrition knowledge also resulted in prescribed needs represented by four food group scores for each individual. This was accomplished by developing a knowledge test

consisting of 24 true-false items related to basic concepts of Canada's Food Guide and distributed equally among the four food groups which served as content domains. One point was assigned for each correct response. Scores representing the perceived or felt needs of each individual were also obtained. This was achieved by using a scaled response indicating the degree to which individuals felt they needed information on 20 topics related to the four food groups, developed as part of a larger questionnaire.

Data resulting from the completion of the interviews were used to test the following research hypotheses stated in the null form:

There is no relationship (correspondence) between educational needs identified as felt needs and those identified to be prescribed needs based on an assessment of at-home mothers' nutrition knowledge of the four food groups.

There is no relationship (correspondence) between needs identified as felt needs and those identified to be prescribed needs based on an assessment of food intake of preschoolers in relation to the four food groups.

Data analysis included the use of the Pearson product-moment correlation coefficient to test the hypotheses given above. Hypotheses were tested at the .05 level of significance. Tabulations of frequencies to provide descriptive information about the characteristics of the sample were also included in the analysis.

The major findings of the study were based on the data of 54 mothers as follows:

- (a) No significant relationships were found between mothers' perception scores and their nutrition knowledge scores for each of the four food groups.

- (b) No significant relationships were found between mothers' perception scores and the food consumption scores of their preschoolers for three of the four food groups. An exception was the fruit and vegetable group where there was a significant relationship.
- (c) Characteristics of the sample included: a mean age for mothers of 28 years, all married or living with a partner, the majority working as full-time homemakers, all possessing at least some high school education with the majority completing their high school or some form of higher education, and about half living on farms and half in towns. In addition, the mean number of the total children per family was 2.6 ranging from infants to school age. Of the three year olds studied, slightly more were female.

In conclusion, this research was not able to support the existence of relationships among the three methods of needs assessment tested in a well-educated population of mothers.

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APPENDIX A

Distribution of Mothers Selected From
Each Nursing District

Distribution of Mothers Selected
From Each Nursing District

| Nursing District | Total Mothers | At-Home Mothers | Sample No. |
|------------------|---------------|-----------------|------------|
| 1 | 44 | 35 | 4 |
| 2 | 53 | 36 | 4 |
| 3 | 34 | 26 | 3 |
| 4 | 25 | 17 | 2 |
| 5 | 40 | 33 | 3 |
| 6 | 32 | 28 | 3 |
| 7 | 42 | 37 | 4 |
| 8 | 85 | 62 | 6 |
| 9 | 44 | 37 | 4 |
| 10 | 40 | 30 | 3 |
| 11 | 79 | 65 | 5 |
| 12 | 51 | 44 | 4 |
| 13 | 42 | 28 | 3 |
| 14 | 42 | 36 | 3 |
| 15 | 28 | 26 | 3 |
| 16 | 25 | 22 | 2 |
| 17 | 45 | 35 | 4 |
| 18 | 25 | 21 | 2 |
| TOTAL | 776 | 618 | 62 |

APPENDIX B

Data Collection Instruments

DEMOGRAPHIC INFORMATIONFor office use
only

Respondent No. _____

| | |
|---|---|
| 1 | 2 |
|---|---|

1. Your present marital status:

- 1 married or living with partner
 2 divorced/separated
 3 widowed
 4 never married
 9 non-response

| |
|---|
| 3 |
|---|

2. Your present age _____ years.

| | |
|---|---|
| 4 | 5 |
|---|---|

3. Place of residence.

- 1 Farm
 2 Town (population under 5000)

| |
|--|
| |
|--|

4. What is the last education that you have completed?

- | | |
|--------------------------|-----------------------------|
| 1 no formal education | 6 some voc/tech school |
| 2 some grade school | 7 completed voc/tech school |
| 3 completed grade school | 10 some university |
| 4 some high school | 11 completed university |
| 5 completed high school | 9 non-response |

| | |
|---|---|
| 7 | 8 |
|---|---|

5. Mother's employment:

- 1 Full-time homemaker
 2 Casual or part-time employment
 3 Full-time employment except in summer months
 4 other, please specify _____

| |
|---|
| 9 |
|---|

- 9 non-response

3 - DAY FOOD RECALL

DATE OF INTERVIEW

NO. _____

Day Month Year

| TIME OF DAY | DAY - 3 FOOD ITEM | Serv. Size | DAY - 2 FOOD ITEM | Serv. Size | DAY - 1 FOOD ITEM | Serv. Size |
|------------------|----------------------|---------------|----------------------|---------------|----------------------|---------------|
| A.M. | | | | | | |
| A.M. SNACK | | | | | | |
| NOON | | | | | | |
| P.M. SNACK | | | | | | |
| SUPPER | | | | | | |
| EVENING SNACK | | | | | | |

FOOD ITEM

AVERAGE FREQ. FOR OFFICE
PORTION USE ONLY

| | | | | |
|---|----------------------|--------------------|--|----------|
| 1. Milk as a bev. incl. 1) whole 2) 2%, 3) skim, buttermilk, cocoa made with milk, flavored milk | 1 cup | | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | 10 11 12 |
| 2. Milk used on cereal, milk pdg, icemilk, yogurt | 1/2 cup | | <input type="checkbox"/> <input type="checkbox"/> | 13 14 |
| 3. Milk used in soup, icecream | 3/4 cup | | <input type="checkbox"/> <input type="checkbox"/> | 15 16 |
| 4. Cheese (firm or processed) | 1 oz. | | <input type="checkbox"/> <input type="checkbox"/> | 17 18 |
| 5. Cottage cheese; processed cheese spread (1 tbsp) | 1/2 cup | | <input type="checkbox"/> <input type="checkbox"/> | 19 20 |
| 6. Eggs | 1 | | <input type="checkbox"/> <input type="checkbox"/> | 21 22 |
| 7. Baked beans, kidney beans, lentils | 1/2 cup | | <input type="checkbox"/> <input type="checkbox"/> | 23 24 |
| 8. Meat, fish, poultry | 1 oz. | | <input type="checkbox"/> <input type="checkbox"/> | 25 26 |
| 9. Peanut butter, nuts | 2 tbsp. 1/2 cup | | <input type="checkbox"/> <input type="checkbox"/> | 27 28 |
| 10. Orange, grapefruit (canned, fresh, frozen, juice incl. vit apple juice), tomato, etc. | 1/2 or 1/4 cup | | <input type="checkbox"/> <input type="checkbox"/> | 29 30 |
| 11. Other fruit/vegetables | 1/2 or 1/4 cup | | <input type="checkbox"/> <input type="checkbox"/> | 31 32 |
| 12. Dark green, yellow and/or orange vegetables | 1/2 or 1/4 cup | | <input type="checkbox"/> <input type="checkbox"/> | 33 34 |
| 13. Other vegetables include potato | 1/2 or 1/4 cup | | <input type="checkbox"/> <input type="checkbox"/> | 35 36 |
| 14. Bread, roll, muffin, tea biscuit, crackers (4) plain pancake/waffle (6" diameter) | 1/2 or 1/2 slice | | <input type="checkbox"/> <input type="checkbox"/> | 37 38 |
| 15. Cereal, cooked or ready- to-eat; less than 15% sugar | 1/2 to 1/2 cup | E _____ W _____ | <input type="checkbox"/> <input type="checkbox"/> | 39 40 |
| 16. Cooked spaghetti, macaroni, noodles, rice | 1/2 cup | E _____ W _____ | <input type="checkbox"/> <input type="checkbox"/> | 41 42 |

E - Enriched

W - Whole Grain

| | FOOD ITEM | AVERAGE PORTION | FREQ. | FOR OFFICE USE ONLY |
|-----|--|-----------------|-------|--|
| 17. | Cereal, sugar coated or presweetened; more than 15% sugar | ½ cup | | <input type="checkbox"/> 42 |
| 18. | French fries or onion rings | 10 | | <input type="checkbox"/> 44 |
| 19. | Fruit drinks with or without Vit. C added | ½ cup | | <input type="checkbox"/> 45 |
| 20. | Gelatin desserts (jello) | ½ cup | | <input type="checkbox"/> 46 |
| 21. | Purchased milkshakes, sundaes, sherbets frozen treats | 3/4 to 1 cup | | <input type="checkbox"/> 47 |
| 22. | Cream cheese | 1 oz. | | <input type="checkbox"/> 48 |
| 23. | Donuts, pastries, sweet buns, cookies (2) | ½ | | <input type="checkbox"/> 49 |
| 24. | Cakes, brownies, squares | ½ | | <input type="checkbox"/> 50 |
| 25. | Chocolate bars, candies, fudge | 1 | | <input type="checkbox"/> 51 |
| 26. | Popcorn | 1 cup | | <input type="checkbox"/> 52 |
| 27. | Potato chips, corn chips or other fried snacks | 1 cup | | <input type="checkbox"/> 53 |
| 28. | Soft drinks, carbonated or uncarbonated, incl. kool-aid, ice tea | ½ cup | | <input type="checkbox"/> 54 |
| 29. | Other | | | <input type="checkbox"/> 55 |
| 30. | Is your preschooler on a special diet? Yes _____ No _____ If yes, what kind of a diet is it? _____ _____ | | | <input type="checkbox"/> 56 <input type="checkbox"/> 57 |

| | FOR OFFICE USE ONLY |
|---|--|
| 31. How does your preschooler's diet differ in summer from other times? 1. More milk and milk products? 2. Less breakfast cereals? 3. More soft drinks or fruit drinks? 4. More sweets? 5. More fruit? 6. More vegetables? 7. Other, please specify 8. No differences? 9. Non-response | <input type="checkbox"/> 58 <input type="checkbox"/> 59 <input type="checkbox"/> 60 <input type="checkbox"/> 61 <input type="checkbox"/> 62 <input type="checkbox"/> 63 <input type="checkbox"/> 64 <input type="checkbox"/> 65 <input type="checkbox"/> 66 <input type="checkbox"/> 67 |
| 32. What type of milk does your preschooler use? 1. Store bought 2. Farm milk 3. Doesn't use milk 4. Non-response | <input type="checkbox"/> 68 |
| 33. How often does your preschooler eat breakfast? 1. Everyday 2. 3 to 5 times a week 3. Once a week 4. Never 5. Non-response | <input type="checkbox"/> 69 <input type="checkbox"/> 70 |
| 34. Is your preschooler taking any vit/mineral supplements? 1. No 2. Vitamins 3. Minerals 4. Both 5. Non-response | <input type="checkbox"/> 70 |

| | FOR OFFICE USE ONLY |
|--|--|
| 35. Which of the following have you given your preschooler this past week? | |
| | 1 2 3 4 5 6 |
| | 1/day 2/day 3-5/wk 4/wk 5/wk don't know |
| Type | |
| Paramettes | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| One-a-day | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Flintstones with iron | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| without iron | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Tri-Vi-Sol | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Tri-Vi-Fluor | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Vitamin C | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Florida | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Other | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 36. Who initially recommended that your preschooler take a vitamin and/or mineral supplement? | <input type="checkbox"/> 80 |
| 37. How often does your preschooler eat away from home? 1. More than once a day 2. Once a day 3. 2 - 3 times a week 4. Once a week 5. 2 - 3 times a month 6. Once a month or less 7. Doesn't eat out 8. Non-response | <input type="checkbox"/> 71 |
| 38. Where are the two most frequent places he would eat when he is away from home? 1. _____ 2. _____ | <input type="checkbox"/> 82 <input type="checkbox"/> 83 |

PART I - PERCEPTIONS

Below are 20 topics. To what extent do you need information on each of these topics to feed your family a healthy diet.

- 1 no need - I don't need information on the topic to feed my family a healthy diet.
- 2 low need - I have only a small need for information on the topic in order to feed my family a healthy diet.
- 3 moderate need - I have a moderate need for information on the topic in order to feed my family a healthy diet.
- 4 fairly high need - I have a fairly high need for information on the topic in order to feed my family a healthy diet.
- 5 high need - I definitely need information on the topic to feed my family a healthy diet.

Circle the number which best describes your need for information on each of the topics below:

No. _____
For office use only

1. When to use supplements which include vitamins A and C.

| | | | | |
|------|---|----------|---|------|
| 1 | 2 | 3 | 4 | 5 |
| no | | moderate | | high |
| need | | need | | need |

2. The food value of various cereals on the market.

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

3. The amount of meat and meat alternates needed daily by preschoolers.

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

4. Foods which can be used as substitutes for whole wheat bread.

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

5. How to prepare economical protein dishes.

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

88

No. _____
For office use
only

6. The effects of different processing methods on the food value of breads and cereals.

| | | | | |
|------|---|----------|---|------|
| 1 | 2 | 3 | 4 | 5 |
| no | | moderate | | high |
| need | | need | | need |

79

7. Foods with a similar calcium content to milk.

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

80

8. The food value of enriched products such as enriched white bread.

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

81

9. The number of servings of vegetables needed daily by family members.

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

82

0. The food value of fruit drinks compared to fruit juices.

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

83

1. The good food sources of vitamin C.

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

84

2. The effects of pasteurization on milk.

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

85

3. The number of servings of breads and cereals needed daily by preschoolers.

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 6 |
|---|---|---|---|---|

86

4. The vitamin content of farm milk compared to store-bought milk.

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

87

No. _____
For office use
only

15. How to prepare, cook and serve vegetables to retain the greatest food value possible.

| | | | | |
|------|---|----------|---|------|
| 1 | 2 | 3 | 4 | 5 |
| no | | moderate | | high |
| need | | need | | need |

18

6. Food sources of iron.

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

19

7. The basic functions of meat and meat alternates in the body.

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

20

8. The food value of yogurt compared to sour cream.

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

101

9. The comparative food value of meat and meat alternates.

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

102

10. The amount of milk needed by children daily.

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

103

11. List other topics on which you feel you need information in order to feed your family a healthy diet.

104

No. _____
For office use
only

PART II - PRACTICES

2. Are you concerned about any of the following in the feeding of your preschool child? Circle as many as apply.

105 106

1 eats too little food

2 eats too much food

3 chooses limited variety of food

4 eats too little fruit

107 108

5 eats too little vegetables, raw or cooked

6 dawdles with food

7 eats too much meat

109 110

10 eats too little meat

11 drinks too much milk

12 drinks too little milk

111 112

13 eats too many sweets

14 other, please specify _____

15 none of the above

3. When your child does not want to eat at mealtime, what do you do? _____

113

114

No. _____
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only

24. Below are some possible influences on preschoolers' eating habits:

- 1 daycare or playschool
- 2 mother
- 3 babysitter
- 4 T.V
- 5 grandparents
- 6 father
- 7 brothers and/or sisters
- 10 friends
- 11 other

115 116

117 118

Which two influences above affect your preschooler's eating habits the most? List them below in order of importance.

- 1. _____
- 2. _____

25. There are many sources of information used by homemakers to guide them in feeding their families. Circle the ones which you have used:

- | | |
|-------------------------|-------------------------------------|
| 1 Television | 11 Pamphlets or sheets on nutrition |
| 2 Radio | 12 Public Health Nurse |
| 3 Newspapers | 13 Dietitian or Nutritionist |
| 4 Friends and Neighbors | 14 Past experience and education |
| 5 Relatives | 15 Doctor |
| 6 Cookbooks | 16 No sources |
| 7 Magazines | 17 Other, please specify |
| 10 Books | |

119 120

121 122

123 124

125 126

127 128

129 130

131 132

133 134

No. _____
For office use
only

26. From the list given in Questions 25, List below in order of importance the three sources of information which you feel have the greatest influence on your practices.

- 1. _____
- 2. _____
- 3. _____

135 136

137 138

139 140

27. If a course related to food and nutrition were offered in your community, would you attend?

yes _____ no _____ uncertain _____

141

28. Which factors listed below would prevent you from participating in a course related to food and nutrition? Circle as many as apply.

- | | | | |
|---|-----------------------|----|-----------------------|
| 1 | babysitting | 6 | time of year |
| 2 | not enough time | 7 | time of day |
| 3 | cost of the course | 10 | don't feel a need |
| 4 | home responsibilities | 11 | other, please specify |
| 5 | no transportation | | _____ |
| | | | _____ |
| | | 12 | none of the above |

142 143

144 145

146 147

148 149

29. If you think there is something important about the feeding of your preschooler that was not asked, please explain below:

150

NUTRITION STATEMENTS

Some statements concerning nutrition are made below. Indicate whether you think each statement is true or false. Circle "T" for true and "F" for false. If you are uncertain, just circle "U."

| | | | | No. _____ For office use only |
|--|---|---|---|-------------------------------------|
| 1. Strawberries, broccoli, and green peppers are poor sources of vitamin C. | T | F | U | <input type="checkbox"/> 151 |
| 2. A peeled sliced potato cooked in a small amount of water conserves just as much vitamin C as a baked potato. | T | F | U | <input type="checkbox"/> 152 |
| 3. A serving of enriched white bread contains about the same food value as a serving of macaroni. | T | F | U | <input type="checkbox"/> 153 |
| 4. Children need at least three servings of bread and cereal each day. | T | F | U | <input type="checkbox"/> 154 |
| 5. People who drink milk from the farm rather than store-bought milk may need a vitamin D supplement. | T | F | U | <input type="checkbox"/> 155 |
| 6. Pasteurization destroys much of the food value of milk. | T | F | U | <input type="checkbox"/> 156 |
| 7. A healthy three year old child eating a variety of fruits and vegetables needs a vitamin supplement to meet his daily requirements of vitamins A and C. | T | F | U | <input type="checkbox"/> 157 |
| 8. Tang has as much food value as orange juice. | T | F | U | <input type="checkbox"/> 158 |
| 9. Butter and sour cream have about the same food value as yogurt and milk. | T | F | U | <input type="checkbox"/> 159 |
| 10. Enriched flour means iron and certain B vitamins have been added. | T | F | U | <input type="checkbox"/> 160 |

No. _____
For office use
only

- | | | | | | |
|---|---|---|---|--------------------------|-----|
| 11. A healthy preschooler needs more than one egg and one to two ounces of chicken to meet his day's requirements for meat and meat alternates. | T | F | U | <input type="checkbox"/> | 161 |
| 12. Baked beans are an economical source of protein. | T | F | U | <input type="checkbox"/> | 162 |
| 13. Apples are an excellent source of vitamin C. | T | F | U | <input type="checkbox"/> | 163 |
| 14. Four ounces of milk have more calcium than one ounce of firm cheese. | T | F | U | <input type="checkbox"/> | 164 |
| 15. Meat is not essential for an adequate diet. | T | F | U | <input type="checkbox"/> | 165 |
| 16. Preschoolers need at least two servings of vegetables each day. | T | F | U | <input type="checkbox"/> | 166 |
| 17. Toasting bread destroys much of its food value. | T | F | U | <input type="checkbox"/> | 167 |
| 18. Skim milk contains about the same amount of protein as whole milk but about half the number of calories per serving. | T | F | U | <input type="checkbox"/> | 168 |
| 19. Peanut butter and baked beans can be substituted for meat. | T | F | U | <input type="checkbox"/> | 169 |
| 20. Healthy children up to 11 years of age need at least 4 cups of milk each day. | T | F | U | <input type="checkbox"/> | 170 |
| 21. Liver is our only good source of iron. | T | F | U | <input type="checkbox"/> | 171 |
| 22. The main reason we need protein foods like cheese and eggs is to give our body energy. | T | F | U | <input type="checkbox"/> | 172 |
| 23. A bran muffin has about the same food value as a slice of whole wheat bread. | T | F | U | <input type="checkbox"/> | 173 |
| 24. Enriched breads and cereals are a good source of energy but a poor source of vitamins and minerals. | T | F | U | <input type="checkbox"/> | 174 |

For office use only

5. Number of children you have in each age category excluding preschooler under study.

- 1 _____ under 12 months of age
- 2 _____ 12 months to 35 months
- 3 _____ 36 months to 47 months
- 4 _____ 48 months to 60 months
- 5 _____ over 60 months (ie: 5 years of age)

7. Does your preschooler attend a playschool, daycare or some other childcare facility on a regular basis?

Yes _____ No _____

If yes, how often _____ hr/week

Where _____

8. Does your budget prevent you from buying any food you would like to purchase for your family?

Yes _____ No _____

If yes, what _____

9. Sex: Male _____ Female _____

0. Comments:

| | |
|--------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> |
| 175 | 176 |
| <input type="checkbox"/> | <input type="checkbox"/> |
| 177 | 178 |
| <input type="checkbox"/> | <input type="checkbox"/> |
| 179 | 180 |
| <input type="checkbox"/> | <input type="checkbox"/> |
| 181 | 182 |
| <input type="checkbox"/> | <input type="checkbox"/> |
| 183 | 184 |
| | <input type="checkbox"/> |
| | 185 |
| <input type="checkbox"/> | <input type="checkbox"/> |
| 186 | 187 |
| <input type="checkbox"/> | <input type="checkbox"/> |
| 188 | 189 |
| | <input type="checkbox"/> |
| | 190 |
| | <input type="checkbox"/> |
| | 191 |
| | <input type="checkbox"/> |
| | 192 |
| | <input type="checkbox"/> |
| | 193 |
| | <input type="checkbox"/> |
| | 194 |

APPENDIX C

Scoring System For Food Consumption Instrument

| Food Item | Average Portion | Times Eaten in Last 3 Days | | | | | | | |
|--|--|------------------------------|-----|-----|-----|-----|----|---|----|
| | | 10+ | 8-9 | 6-7 | 4-5 | 2-3 | 1 | 0 | |
| 1. Milk as a beverage including whole, 2%, skim, buttermilk, cocoa made with milk, flavored milk | 1 cup | 6 | 6 | 6 | 4 | 2 | 1 | 0 | |
| 2. Milk used on cereal, milk pudding, icemilk, yogurt | $\frac{1}{2}$ cup | 5 | 4 | 3 | 2 | 1 | .5 | 0 | |
| 3. Milk used in soup; icecream | $\frac{3}{4}$ cup | 5 | 4 | 3 | 2 | 1 | .5 | 0 | |
| 4. Cheese (firm or processed) | 1 oz. | 6 | 5 | 4 | 3 | 1 | 1 | 0 | |
| 5. Cottage cheese | $\frac{1}{2}$ cup | 3 | 2 | 2 | 1 | 1 | .5 | 0 | |
| | | MILK AND MILK PRODUCTS SCORE | | | | | | | 6 |
| 6. Eggs | 1 | 6 | 6 | 4 | 3 | 2 | 1 | 0 | |
| 7. Baked beans, kidney beans, lentils, peas | $\frac{1}{4}$ cup | 3 | 3 | 2 | 2 | 1 | 1 | 0 | |
| 8. Meat, fish, poultry | 1 oz. | 6 | 5 | 4 | 3 | 2 | 1 | 0 | |
| 9. Peanut butter, nuts | 2 tbsp. | 6 | 5 | 4 | 3 | 2 | 1 | 0 | |
| | | MEAT AND ALTERNATES SCORE | | | | | | | 6 |
| 10. Orange, grapefruit (canned, fresh, frozen juice incl. vit. apple juice), tomato, etc. | $\frac{1}{2}$ piece $\frac{1}{4}$ cup or equivalent | 2 | 2 | 2 | 2 | 2 | 1 | 0 | |
| 11. Other fruit/vegetable | $\frac{1}{4}$ cup | 1 | 1 | 1 | 1 | 1 | .5 | 0 | |
| 12. Dark green, yellow and/or orange vegetable | $\frac{1}{4}$ cup or equivalent | 2 | 2 | 2 | 2 | 2 | 1 | 0 | |
| 13. Other vegetable including potato | $\frac{1}{4}$ cup | 1 | 1 | 1 | 1 | 1 | .5 | 0 | |
| | | FRUIT AND VEGETABLE SCORE | | | | | | | 6 |
| 14. Bread, roll, muffin, tea biscuit, crackers (4), plain pancake/waffle (6" diameter) | $\frac{1}{2}$ or $\frac{1}{2}$ slice | 6 | 5 | 4 | 3 | 2 | 1 | 0 | |
| 15. Cereal cooked or ready-to-eat 15% sugar | $\frac{1}{4}$ - $\frac{1}{2}$ cup | 6 | 5 | 4 | 3 | 2 | 1 | 0 | |
| 16. Cooked spaghetti, macaroni, noodles, rice | $\frac{1}{4}$ cup | 6 | 5 | 4 | 3 | 2 | 1 | 0 | |
| | | BREAD AND CEREALS SCORE | | | | | | | 6 |
| TOTAL SCORE | | | | | | | | | 24 |

Note. mixed dishes will be broken down into respective categories

APPENDIX D

Correspondence



From Regina Rural Region

Date April 10, 1981

To Distribution List

Phone

Re Preschool Nutrition Study

Your File

Our File 4273

Your views on the following as briefly discussed at our recent meeting would be most helpful.

Could you list all those ideas or concepts which you feel should be included as part of the content or message(s) of a nutrition education program for mothers of preschoolers (3 to 4 years old). When I refer to content, I am particularly interested in a simple list of ideas or concepts you would stress to the mother in relation to:

1. each of the four food groups considered separately ie: about milk and milk products, vegetables and fruit consumption, meat and alternates, cereals and breads, "other" foods.
2. eating patterns or food patterns.
3. management of feeding problems which you anticipate the mother may have with her preschooler.
4. other

The above could be based on your experience, knowledge of the literature or other programs, questions you receive from parents, nurses etc. This information would be most helpful to me before the end of the month.

Eunice Misskey
Regional Nutritionist

TO:

May 19, 1981

FROM: Eunice Misskey

RE: Nutrition Knowledge Test for Preschool Project

Enclosed is a copy of a knowledge test, one of three data collection instruments to be used during interviews with mothers of preschoolers as part of the Preschool Nutrition Project.

This test consists of 40 statements with the key to scoring included. These statements were specifically developed to measure mother's knowledge of the four food groups in Canada's Food Guide and are based on a Conceptual Framework designed for this purpose. Earlier input from a number of Nutritionists served as one source of ideas for the statements. Additional sources included other instruments, CFG Handbook, nurses input, experience with mothers etc.

I am asking you, as one of 12 Nutritionists to help me validate this instrument by reading each of the 40 statements and crossing out any statement if you disagree with the "true" or "false" answer given in the key. In addition, please feel free to make comments or any suggestions concerning awkwardness or ambiguity of any particular statement by writing notes next to the statement in the margin or at the bottom of page 5.

I estimate that this exercise could take 10 to 15 minutes of your time. Please feel free to call me at 586-1351 or 565-3174 (work) if you have any questions.

In order that I can use the information you may be able to provide I am requesting the return of this instrument with your input by May 27, 1981. If you live in Regina, just give me a call and I can pick it up.

Thank you for any assistance you can provide.

Eunice Misskey
Regional Nutritionist



From Eunice Misskey
Regina Rural Health Region

Date June 10, 1981

Phone

To

Your File

Re Mothers Perceptions and Practices

Our File

Thank you for providing input on the knowledge test. Your suggestions were helpful to me in making revisions. The revised test was administered to over 30 mothers on an individual basis and data are presently being analyzed to determine reliability of the test. On the basis of the results, further revisions will be made prior to its use during the final interviews.

I have enclosed the first draft of another instrument which will also be used with mothers of preschoolers to determine mother's perceptions and practices. As part of the final data analysis, scores obtained from the first 20 statements of this instrument will be compared with mother's knowledge scores and scores obtained in relation to preschooler's eating habits. I am therefore requesting Nutritionists to make any comments or suggestions on how they would improve the first 20 statements so that they best reflect topics related to each of the four food groups as coded in margin (i.e. FV - Fruit-Vegetable group). Please feel free to write comments in the space indicated "for office use only". If you feel other topics related to the four food groups should be included, please specify. Comments on the other questions (i.e. Q. 22 - 27) would also be welcome if you have the time.

I estimate that this exercise could take 10 - 20 minutes to complete. If you can only spare 5 minutes I would appreciate any comments you might be able to come up with in that time.

In order that I can use the information you may send, I am requesting the return of this instrument with your input by June 22nd.

Thank you for any advice you can give on such short notice.

Eunice Misskey
Regional Nutritionist

APPENDIX E

Individual Perception, Knowledge, and
Food Consumption Scores for Each of
the Four Food Groups

Individual Perception, Knowledge, and
Food Consumption Scores for Each of
the Four Food Groups

| Subject No. | Milk and Milk Products | | | Meat and Alternates | | | Fruit and Vegetables | | | Bread and Cereals | | |
|-------------|------------------------|---|-----|---------------------|---|----|----------------------|---|-----|-------------------|---|----|
| | P | K | FC | P | K | FC | P | K | FC | P | K | FC |
| 1 | 25 | 4 | 6 | 21 | 1 | 6 | 25 | 5 | 4 | 21 | 6 | 6 |
| 2 | 12 | 1 | 3 | 11 | 1 | 6 | 13 | 4 | 6 | 12 | 1 | 6 |
| 3 | 17 | 2 | 6 | 11 | 4 | 4 | 16 | 4 | 6 | 13 | 1 | 6 |
| 4 | 17 | 5 | 6 | 13 | 4 | 5 | 17 | 5 | 6 | 15 | 3 | 6 |
| 5 | 20 | 1 | 6 | 9 | 3 | 6 | 9 | 2 | 2 | 13 | 2 | 6 |
| 6 | 21 | 1 | 3 | 15 | 5 | 6 | 20 | 4 | 6 | 13 | 5 | 6 |
| 7 | 19 | 1 | 5 | 18 | 4 | 6 | 16 | 4 | 1.5 | 15 | 5 | 6 |
| 8 | 18 | 2 | 3.5 | 19 | 4 | 6 | 22 | 5 | 4 | 22 | 1 | 6 |
| 9 | 20 | 3 | 4.5 | 20 | 6 | 6 | 23 | 5 | 6 | 18 | 5 | 6 |
| 10 | 17 | 5 | 4 | 20 | 5 | 5 | 25 | 6 | 6 | 13 | 3 | 6 |
| 11 | 8 | 2 | 5.5 | 11 | 6 | 4 | 17 | 6 | 4 | 18 | 4 | 6 |
| 12 | 23 | 5 | 6 | 18 | 4 | 5 | 19 | 5 | 6 | 19 | 3 | 6 |
| 13 | 7 | 2 | 4 | 9 | 3 | 5 | 7 | 5 | 4 | 7 | 1 | 5 |
| 14 | 23 | 3 | 6 | 20 | 5 | 4 | 23 | 4 | 5 | 17 | 2 | 6 |
| 15 | 21 | 3 | 2.5 | 14 | 3 | 6 | 19 | 2 | 5 | 18 | 4 | 6 |
| 16 | 13 | 1 | 6 | 13 | 2 | 6 | 17 | 4 | 5 | 14 | 1 | 6 |
| 17 | 13 | 0 | 3.5 | 11 | 1 | 6 | 13 | 4 | 4 | 10 | 3 | 6 |
| 18 | 10 | 3 | 6 | 10 | 4 | 6 | 14 | 4 | 5 | 17 | 2 | 6 |
| 19 | 25 | 3 | 6 | 25 | 2 | 6 | 24 | 5 | 6 | 23 | 3 | 6 |
| 20 | 15 | 3 | 6 | 15 | 6 | 6 | 13 | 2 | 5 | 14 | 2 | 6 |
| 21 | 19 | 3 | 4.5 | 13 | 2 | 5 | 20 | 4 | 5 | 19 | 2 | 6 |
| 22 | 21 | 4 | 2.5 | 24 | 6 | 3 | 22 | 5 | 4 | 21 | 1 | 6 |
| 23 | 20 | 2 | 6 | 15 | 5 | 3 | 14 | 3 | 4 | 19 | 2 | 5 |
| 24 | 8 | 3 | 3 | 10 | 4 | 6 | 11 | 6 | 3 | 16 | 6 | 5 |
| 25 | 15 | 0 | 6 | 15 | 3 | 6 | 12 | 3 | 6 | 13 | 1 | 6 |
| 26 | 11 | 4 | 4 | 14 | 5 | 6 | 19 | 4 | 6 | 12 | 4 | 6 |
| 27 | 16 | 2 | 4 | 16 | 2 | 6 | 15 | 3 | 6 | 16 | 0 | 6 |
| 29 | 25 | 3 | 6 | 24 | 5 | 3 | 24 | 4 | 4 | 24 | 5 | 6 |
| 30 | 11 | 3 | 6 | 10 | 4 | 5 | 14 | 5 | 5 | 15 | 4 | 6 |

(Continued....)

| Subject No. | Milk and Milk Products | | | Meat and Alternates | | | Fruit and Vegetables | | | Bread and Cereals | | |
|-------------|------------------------|---|-----|---------------------|---|----|----------------------|---|-----|-------------------|---|----|
| | P | K | FC | P | K | FC | P | K | FC | P | K | FC |
| 31 | 17 | 0 | 5.5 | 16 | 4 | 4 | 24 | 3 | 6 | 11 | 3 | 6 |
| 32 | 16 | 2 | 6 | 14 | 3 | 2 | 14 | 4 | 1 | 18 | 3 | 6 |
| 33 | 23 | 2 | 3.5 | 23 | 5 | 3 | 22 | 4 | 4 | 20 | 3 | 6 |
| 34 | 17 | 4 | 6 | 19 | 5 | 5 | 17 | 4 | 6 | 16 | 5 | 6 |
| 35 | 19 | 5 | 3 | 16 | 5 | 6 | 21 | 4 | 4 | 20 | 5 | 6 |
| 36 | 8 | 1 | 6 | 11 | 6 | 6 | 12 | 3 | 5 | 16 | 3 | 6 |
| 37 | 13 | 2 | 6 | 16 | 5 | 5 | 21 | 4 | 6 | 17 | 5 | 6 |
| 38 | 24 | 2 | 6 | 24 | 4 | 5 | 22 | 4 | 6 | 18 | 2 | 5 |
| 39 | 17 | 2 | 4.5 | 19 | 3 | 4 | 23 | 3 | 6 | 17 | 2 | 6 |
| 40 | 13 | 1 | 6 | 14 | 4 | 6 | 10 | 3 | 3.5 | 11 | 5 | 6 |
| 41 | 22 | 2 | 6 | 16 | 5 | 3 | 19 | 5 | 5 | 15 | 4 | 6 |
| 42 | 19 | 2 | 1 | 18 | 1 | 6 | 19 | 4 | 4 | 19 | 3 | 6 |
| 43 | 25 | 4 | 1.5 | 20 | 5 | 6 | 19 | 2 | 6 | 23 | 4 | 6 |
| 44 | 22 | 3 | 5 | 20 | 6 | 6 | 23 | 3 | 5 | 20 | 5 | 6 |
| 45 | 21 | 2 | 3.5 | 20 | 6 | 4 | 15 | 5 | 4 | 15 | 3 | 6 |
| 47 | 12 | 1 | 6 | 9 | 5 | 4 | 10 | 2 | 6 | 13 | 3 | 6 |
| 48 | 23 | 1 | 6 | 17 | 5 | 6 | 19 | 6 | 5 | 25 | 2 | 6 |
| 49 | 14 | 2 | 5.5 | 12 | 4 | 6 | 16 | 6 | 6 | 14 | 2 | 6 |
| 50 | 22 | 1 | 3.5 | 12 | 3 | 3 | 11 | 3 | 6 | 19 | 2 | 6 |
| 53 | 25 | 3 | 4 | 20 | 3 | 6 | 21 | 3 | 5.5 | 22 | 6 | 6 |
| 54 | 17 | 5 | 5 | 23 | 5 | 6 | 24 | 5 | 6 | 24 | 4 | 6 |
| 55 | 12 | 2 | 6 | 10 | 1 | 2 | 14 | 3 | 5.5 | 15 | 4 | 5 |
| 56 | 22 | 2 | 5 | 18 | 4 | 4 | 20 | 2 | 5 | 14 | 5 | 6 |
| 57 | 17 | 1 | 5 | 17 | 4 | 2 | 17 | 6 | 3 | 22 | 2 | 6 |
| 58 | 19 | 4 | 6 | 18 | 4 | 6 | 21 | 5 | 6 | 18 | 4 | 6 |

Note. 1. Maximum perception score = 25.
Maximum knowledge score = 6.
Maximum food consumption score = 6.

2. Subject numbers 28, 46, 51, and 52 did not meet all selection criteria and were, therefore, excluded from data analysis.