

WOMEN'S PERCEPTIONS OF FOLATE-
CONTAINING FOODS

By

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**WOMEN'S PERCEPTIONS OF FOLATE-
CONTAINING FOODS**

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and Intakes by Individuals (CSFII) mean dietary folate intake is not nearly half of the current recommendation (NAS 1998). Due to changes in food products and intake are expected to be slightly higher (NAS 1998).

CHAPTER I
INTRODUCTION

Conclusive evidence exists that folate is critical for the formation of the embryonic neural tube and an inadequate intake leads to the occurrence of neural tube defects (NTDs) (Butterworth and Bendich 1996, Scott et al. 1995). Neural Tube Defects are among the most common severe birth defects. In the case of spina bifida, when the spinal cord fails to close, the infant usually survives but with severe disabilities; anencephaly is the result of incomplete closure of the skull, which leads to infant mortality (Scott et al. 1995). Some of these deaths and disabilities are preventable. When consumed adequately before conception and during pregnancy, folic acid can reduce the occurrence of NTDs by at least 50% (MRC 1991).

Neural tube malformations occur during the first four weeks of embryonic development when most women are unaware of the pregnancy (McNulty 1997). Since many pregnancies are unintended (Henshaw 1998), adequate folate is important for all women capable of bearing a child. In 1992, the Public Health Service (PHS) recommended that all women of childbearing age consume 400 mcg of folic acid each day for the prevention of neural tube defects (CDC 1992).

Research indicates many women of childbearing age are not consuming the recommended intake of 400 mcg of folic acid for the prevention of NTDs (Alaimo et al. 1994, Subar et al. 1989, Gates and Holmes 1999). Data from the Third National Health and Nutrition Examination Survey (NHANES III) and the 1989-91 Continuing Survey of

Food Intakes by Individuals (CSFII) reveals that the mean dietary folate intake is approximately half of the current recommendation (NAS 1998). Due to changes in fortification of grain products and inconsistencies in the analysis of the folate content of food, actual levels of intake are expected to be slightly higher (NAS 1998).

A major step has been taken to improve the levels of folic acid in the American diet. The Food and Drug Administration's (FDA's) amended the food additive regulations to include folic acid in enriched grain products (FDA 1996). These regulations became effective on January 1, 1998. This modification of grain products is expected to narrow the gap between the folate need and actual intake of women; however, estimates indicate the fortification will only add 100 mcg of folic acid daily based on U.S. women's current dietary habits (NAS 1998). For many women folate intake will remain inadequate; therefore, to reach the PHS recommended 400 mcg of folic acid, women will need to make changes in food consumption. The Center for Disease Control suggests three recommendations for achieving adequate folate: (a) take a vitamin supplement containing folic acid, (b) increase consumption of foods fortified with folic acid, or (c) increase consumption of foods naturally high in folates (CDC 1999). In conjunction with fortification, the FDA recommends an active approach of nutrition education and guidance to increase folate intake among child bearing age women (FDA 1996).

In addition to the risk for NTD, recent research indicates that adequate folate intake may reduce the risk of cardiovascular disease (NAS 1998). Although the research appears promising, it is inconclusive. Therefore, the reduction of this risk factor was not

used as a basis for determining the Estimated Average Requirement (EAR) or the Social Recommended Dietary Allowance (RDA) of folic acid (NAS 1998). The

Research indicates that nutrition knowledge alone is not a predictive indicator of healthy dietary behavior (Nestle et al. 1998). To promote healthy dietary change, it is important to understand factors that influence food choices (de Graaf et al. 1997). Nutrition intervention must not only provide accurate nutrition information but also include strategies that lead to change. Long-term commitment and compliance to a healthy diet are problems that need to be addressed by all who take part in nutrition education. There is a need for more information on women's attitudes and perceptions of their dietary behavior to improve the impact of nutrition education programs for dietary improvement. With a better understanding of women's behaviors and of environmental factors that affect their food choices, nutrition educators can determine areas to target for the promotion of food intake and provide strategies that will lead to long-term compliance (Nestle et al. 1998).

The objectives of this research project were to use focus group discussions to determine childbearing age women's perceptions of (a) folic acid, vitamin supplements and a healthy diet; (b) influences on their food choices; (c) barriers to eating a diet adequate in fruit, vegetables and grains; and (d) motivations for dietary behavior change. Another objective of the project was to obtain the women's ideas on strategies for nutrition professionals to use in improving fruit, vegetable and grain intake in women who may not be meeting the recommendations for folate intake. It is expected that achievement of the objectives through an evaluation of women's perceptions of dietary behavior will lead to more effective nutrition intervention strategies. Perceptions of food

behavior and influences of the women in the focus groups were obtained using the Social Cognitive Theory as the theoretical framework for the interview questions. The following chapter is a review of related literature.

Definition of Terms

Knowledge – Use of the mind, intellectual ability, rational learning (e.g. recalling, remembering and recognizing) (Chamberlain 1992).

Attitudes – A learned predisposition to respond in a specific way, negative or positive, toward people, ideas or situations (Haber and Runyon 1974).

Beliefs – Perceptions of factual matters, of what is true or false or the cognitive aspect of attitudes (Crider et al. 1989, Parraga 1990).

Behavior – Any activity that can be observed, recorded and measured (Crider et al. 1989).

CHAPTER II
subventricular systems in 16 states, the prevalence of spinal bifida between 1983 and 1990

was 1.6 per 10,000 births (CDC 1996). Similarly, CDC Birth Defects Monitoring

Program reported the birth prevalence of neural tube defects per 10,000 (CDC 1996).

The prevalence of NTDs associated with these occurrences in the U.S. is approximately 200

Problems with Inadequate Folate Intake Although some cases of NTDs have a genetic link

Throughout this paper the terms, folate and folic acid, are used. Folic acid refers to the synthetic form of folate used in vitamin supplements and for the fortification of grain products. In order for intestinal absorption to occur, naturally occurring folate requires cleavage by the enzyme conjugase. Folic acid does not require the action of conjugase for absorption to occur (Butterworth and Bendich 1996). Often the word folate is used as a generic term for the different forms of the vitamin.

Folate plays a role in DNA, RNA and protein synthesis necessary for cell replication and growth. Pregnancy is a time of rapid cell development and an important need for folate exists especially during the first month of embryonic development. Research evidence indicates a deficiency of folate can lead to embryonic brain or spinal malformations, most commonly known as Neural Tube Defects (NTD) (Scott et al. 1995). Neural Tube Defects occur during the first four weeks of gestation often before a woman may be aware of the pregnancy (McNulty 1997) and many pregnancies are unintended (Henshaw 1998), so adequate folate is important for all women of childbearing age.

In the case of spina bifida the spinal cord fails to close resulting in severe disabilities. Another NTD is anencephaly, which results from the incomplete closure of the skull and leads to certain death (Scott et al. 1995). According to the combined data of

surveillance systems in 16 states, the prevalence of spinal bifida between 1983 and 1990 was 4.6 per 10,000 births (CDC 1996). Similarly, CDC Birth Defects Monitoring Program found the birth prevalence of spina bifida to be 4.4 per 10,000 (CDC 1996). The medical cost associated with these occurrences in the U.S. is approximately 200 million dollars each year (CDC 1989). Although some cases of NTDs have a genetic link (Scott et al. 1995), when consumed in adequate amounts, folate can reduce the occurrence of NTDs by 50% (MRC 1991). Preventing the NTDs through improved folate intakes benefits the lives of children and provides an economic benefit to the nation.

Recent research has found that folate has the potential to impact even more lives. Elevated homocysteine levels in the blood are linked to cardiovascular disease, and folate has been associated with decreasing homocysteine levels (McNulty 1997). Malinow et al. (1998) studied the effects of cereal fortified with folic acid on plasma homocysteine levels. Subjects consuming cereal fortified with 499 mcg or 665 mcg per day had significantly lower levels of plasma homocysteine. However, 127 mcg of folic acid did not significantly lower levels of homocysteine. Brouwer et al. (1999) supplemented 18 to 40 year old women with folic acid to study the effects on plasma total homocysteine levels. The researchers found that supplementation with 500 mcg of folic acid every day or every other day both significantly decreased plasma total homocysteine levels.

Sources of Folate

Folates occur naturally in a variety of foods and synthetic folic acid is used in fortified foods and supplements. Research findings indicate that approximately one

quarter of Americans consume dietary supplements containing folic acid each day (Gates and Holmes 1999, Subar and Block 1990). Since the 1st of January 1998, the FDA requires manufacturers to add folic acid to enriched flour, bread, rolls, farina, corn grits, corn meal, rice and noodle products (FDA 1996). In the U.S. food supply, the foods naturally richest in folates are liver, legumes, and dark green vegetables, but these foods do not rank the highest in actual intake according to the NHANES II data (Subar et al. 1989). Subar et al. (1989) analyzed the NHANES II data and found that the major contributors of folate to the American diet were orange juice, white bread, cooked dried beans, green salad, cold cereal and eggs. According to data from the 1994-95 CSFII, cereals, citrus fruits and juices, and grain mixtures such as pizza and breads were the major sources of folate (Gates and Holmes 1999). Ready-to-eat cereals provided the most folate at about 20% of the total folate intake.

Albertson et al. (1997) evaluated the folate intakes of 2,224 women who had participated in the General Mills Dietary Intake Study. The researchers found 40% of daily folate intake of cereal eaters to be from grains (approximately 30% from cereal and 10% from bread). Among non-cereal eaters, fruits and vegetables were the most significant source of folate at 32%, and for cereal eaters, fruits and vegetables contributed almost 25%. Mixed dishes contributed 10% of the folate in cereal eaters and 14% in non-cereal eaters. Other sources contributing folate to the diet included nuts and legumes, coffee, tea, alcoholic beverages, eggs, milk and desserts. Average folate intakes were higher for cereal eaters (220 mcg) than non-cereal eaters (137 mcg). However both groups fell short of recommendations.

Current Intake of Folate

Research indicates women of childbearing age are not consuming the recommended intake of 400 mcg of folic acid for the prevention of NTDs (Alaimo et al. 1994, Subar et al. 1989). The mean intake of folate was 229 mcg for women between 20 and 50 years of age based on data collected in the Third National Health and Nutrition Examination Survey (NHANES III), conducted by the National Center for Health Statistics (NCHS), Centers for Disease Control and Prevention (CDC) (Alaimo et al. 1994). An analysis of data collected in the 1994-95 Continuing Survey of Food Intakes by Individuals (CSFII) revealed that only 7.7% of the 2,086 women of childbearing age consumed the recommended 400 mcg folate per day (Gates and Holmes 1999). The mean intake of folate was 215 mcg/d (Gates and Holmes 1999), slightly over half of what is recommended. Due to changes in fortification of grain products and inconsistencies in the analysis of the folate content of food, these values of intake are expected to be slight underestimations of actual intake (NAS 1998). The modification of grain products is expected to add 100 mcg of folate to diets of women based on current food habits in the U.S. (NAS 1998). Despite fortification, folic acid intakes are expected to be inadequate.

Based on a comparison of diets to the Food Guide Pyramid, many American women are not meeting the recommendations for fruit, vegetables, and grains, the foods that are good sources of folate. The results of the 1994-95 CSFII were analyzed to determine the average servings from grains, fruits and vegetables (FSRG/BHNRC 1997). Women between 20 and 50 years of age ate on average 5 1/2 servings of grains and based on their energy need, approximately 70% failed to meet recommendations for grains. On average, 3 servings of vegetables were eaten with 59% of subjects failing to meet

recommendations. Fruit intakes were even lower with only 21% meeting something about recommendations and a daily serving of 1 1/3. Krebs-Smith et al. (1997) found that less than 1% of women consumed the recommended servings from all the food groups. (1999).

In the 1998 March of Dimes Gallup poll, of the 66% of respondents who had heard of Knowledge and Awareness of Folate green leafy vegetables and orange juice were good foods. Delucia (1996) analyzed data from the 1994 Continuing Survey of Food Intakes by Individuals/Diet Health and Knowledge Survey (CSFII/DHKS) and found knowledge of the recommended number of servings from the different folate-containing food groups to be poor. Most knew the amount of fruit to consume each day; however, less than half correctly answered the correct number of vegetable servings and only 5% of participants knew the correct number of daily grain servings. Morton and Guthrie (1997) used data from the 1994 CSFII/DHKS to compare diet-related knowledge of low-income and high-income Americans with families. Only 2% of low-income respondents with families knew the correct number of servings from bread, cereal, rice, and pasta group compared to 9% of high-income respondents.

Before designing health education interventions, it is important to understand women's awareness of folate's value to the human body. A recent study with 251 low-income pregnant women found that 57% of the women had heard of folate but only 26% could correctly define it and only 30% could list a food source (Kloeblen 1999). Perez-Escamilla et al. (1999) surveyed 426 predominately Latino inner-city residents (the majority were mothers in their early 30s) and found that 17% had never heard of spina bifida or NTDs and a mere 11% knew folic acid could prevent these defects. In 1998, the Gallup Organization conducted a poll for the March of Dimes Birth Defects Foundation

and found that 68% of women ages 18 to 45 years had heard or read something about folic acid (CDC 1999). Of the women surveyed, only 13% knew that folic acid prevents birth defects and only 7% knew folic acid should be taken before pregnancy (CDC 1999). In the 1997 March of Dimes Gallup poll, of the 66% of respondents who had heard of folic acid, less than a quarter knew green leafy vegetables and orange juice were good food sources (CDC 1997). This research reiterates the need for nutrition professionals to use their knowledge and resources to further educate the public on the importance of folates and their food sources. Although it is important to increase the awareness of folates and their benefits to the human body, research indicates that nutrition knowledge alone is not a predictive indicator of positive dietary behavior (Nestle et al. 1998).

Factors that Influence Food Choices

A report published in Nutrition Reviews addresses behavioral and social influences on food choices (Nestle et al. 1998). Nestle and her colleagues state that “Culture is the pervasive foundation that underlies all food choices. People construct their perceptions, beliefs, and attitudes about foods on the basis of cultural values with psychosocial factors shaping their food choices” (Nestle et al. 1998, p.551).

Environmental, cognitive and personality factors can all play a role in dietary choices. The understanding of critical influences on food choices can help nutrition professionals in targeting areas for dietary change. The following sections will discuss research that evaluates influences on food choices.

Food Patterning Missouri survey found similar associations for fruit and vegetable consumption. Culture plays a role in modifying and controlling the selection of foods. Bennett et al. (1942) first identified the terms core diet, secondary core diet, and peripheral diet. Jerome (1976) used the terms coined by Bennett to describe the cyclical patterning of food into the diet. Jerome conducted field studies in 42 homes in Kansas City to evaluate their eating patterns. The data on food consumption indicated the existence of a large number of dietary items in the highest and lowest frequency categories. The frequency in and consumption of a large number of foods by many individuals led Jerome to suggest that “diet individuation” (personal preference and selection) drive food choices and consumption in modern societies, which have constant and abundant food supplies, such as the United States (p. 92).

Between 1965 and 1966 Jerome studied the interaction of nutrition and culture of southern blacks who migrated to a northern metropolitan environment (Jerome 1975, Jerome 1980). He found the change of food habits over time was dependent upon individual characteristics, group characteristics, adjustment to the new environment, values established by the environment, and the amount of common cultural contact in the environment. The industrialized change from the production to purchase of food led to a high calorie and varied diet with the retention of many traditional food items.

Demographic Characteristics

Hunt et al. (1997) found that those who were older, more educated, and women were more likely to follow eating patterns closest to dietary recommendations regarding fiber, fruits, vegetables, and fat intakes than individuals who were younger, less educated,

and male. A statewide Missouri survey found similar associations for fruit and vegetable intake with regard to age and education levels (Hagdrup et al. 1998). In the Missouri study, individuals over 65 years of age were three times more likely than those 18 to 34 years old and twice as likely as 35 to 64 year olds to eat the recommended 5 or more serving of fruit and vegetables. Hagdrup et al. (1998) reported that college graduates ate more fruit and vegetables than those who had less than a high school education. Krebs-Smith et al. (1997) revealed that those with less than a high school education and those with income below 130% of the poverty level were less likely to know that five or more servings of fruit and vegetables were needed.

It appears an increase in age and education increases health awareness. In a representative European study, those who were older, more educated and female were more likely to indicate that trying to eat healthy was an influence on their food choices (Lennernas et al. 1997). Krebs-Smith et al. (1997) found that the number of people indicating they made it a habit to eat a lot of fruits and vegetables increased with age.

Glanz et al. (1998) reviewed two self-administered cross-sectional surveys to examine the importance of taste, nutrition, cost, convenience, and weight control on dietary choices. These factors varied across demographic groups. Taste was more important to women and some ethnic groups. Weight control and nutrition were more important to older respondents, women and certain ethnic groups. Younger respondents, women and lower income individuals found cost to be more important. The importance of convenience was higher for younger respondents and individuals with lower incomes.

Attitudes and Food Perceptions

Devine et al. (1998) used a qualitative procedure for analyzing life-course influences on fruit and vegetable choices. Thirty- to 60-minute interviews were conducted with 86 low- to moderate-income adults living in an urban area of Upstate New York. The subjects were of varying ethnicity and between the ages of 18 and 80. The study revealed the following effects of personal and environmental influences throughout a person's lifetime on food choices: early childhood food experiences; role transitions such as childbearing, marriage, and employment; health status; ethnic traditions; resources; and location. The authors' findings suggested that individual's lifetime experiences have long-lasting effects on food choices that are affected by exposure to new factors.

In the United States Department of Agriculture (USDA) Diet Health and Knowledge Survey (DHKS) 1989-91, main meal preparers were asked about their perception of factors important in selecting foods while grocery shopping (LSRO 1995). Taste, product safety, nutrition, food-storage quality and price were considered highly important in grocery shopping by more than two-thirds of the female meal preparers. Over half indicated ease of preparation to be highly important. Lennernas et al. (1997) asked over 14,000 Europeans to rank the three most important factors that most influenced their food choices. Out of 14 factors, quality/freshness, price, trying to eat healthy, and family preferences were the factors most commonly selected by women (Lennernas et al. 1997).

Betts et al. (1995) conducted 57 focus groups with 18-24 year olds across seven states. Comments involving the effect of time on food choices were mentioned most

frequently. Due to time constraints, foods that were convenient to prepare were chosen often. Price was also mentioned as a factor impacting food choices in 88% of the focus groups. In 82% of the groups, health concerns and the fat and cholesterol contents of foods affected food decisions. Cravings (72%) and taste (60%) were mentioned. Nutrient content was indicated as a factor in 68% of the groups. Quality, availability and weight control were also mentioned as influences in 63%, 58%, and 56% of the groups, respectively. In the past few years more research has been done comparing perceptions with relative food intakes.

Glanz et al. (1998) collected data from two nationwide surveys of adults and examined the importance of taste, nutrition, cost, convenience, and weight control on dietary choices. The authors found the importance of taste, nutrition, convenience, and weight concerns predicted fruit and vegetable consumption. Cost and convenience predicted the consumption of breakfast cereal. As discussed previously demographic characteristics affected the importance placed on the different variables. Health lifestyle orientation was also analyzed. Individuals were placed in one of seven healthy lifestyle clusters based on their health-related behaviors. The results indicated that health lifestyle orientation was significantly associated with the relative importance of all five factors, especially nutrition and weight control.

Across three states, 508 young men and women between the ages of 18 and 24 were surveyed by Keim et al. (1997). Relationships between the perceptions about fruit and vegetables and relative intake were calculated through an analysis of a 60-item food frequency questionnaire and a repertory grid completed by the young adults. The repertory grid included a list of 20 foods and 11 constructs describing perceptions about

foods. The constructs were rated on a scale of one to five for each food item. A separate factor analysis of the repertory grid responses revealed that the individuals view foods in terms of sensory and social perceptions (factor 1) and health and fattening perceptions (factor 2). When a fruit or vegetable was perceived as “tasty,” “a habit to eat,” one that was “eaten out,” and “looks good to eat” (these being the factor 1 perceptions), subjects ate significantly more of the fruit or vegetable. According to Keim et al. (1997), the healthy and fattening perceptions of the fruits and vegetables appeared to have less of an influence on selection. Similar results can be found in another research article published by the same group of authors.

Betts and her colleagues (1997) surveyed 1,482 young adults between the ages of 18 and 24 from 10 states. Factor analysis revealed that the young adults “view foods in terms of social/physical characteristics, health-promoting aspects, nutrition related aspects balanced with purchasing and preparation abilities, and adequacy of stores and cooking facilities” (Betts et al. 1997, p. 78). When orange juice and broccoli were perceived as being a habit, tasting good, friends eating, looking good and one eaten out (social/physical characteristics) the young adult consumed more. In addition, individuals who perceived broccoli as convenient or filling consumed more. The perception of habit had the strongest correlation with the frequency of consumption of all the different food items. Betts et al. (1997) failed to find fattening or healthy perceptions to be related to the frequency of food intake.

As part of the 5 A Day Program, a telephone survey was conducted in 1991 to obtain data on adults’ intake, knowledge, perceptions, and attitudes of fruits and vegetables (Krebs-Smith et al. 1995). Krebs-Smith and her colleagues (1995) found that

a habit of eating fruits and vegetables since childhood, liking the taste and the number of servings individuals thought they needed were the factors most related to both fruit and vegetable intake. The perception of availability was significantly related to fruit intake.

Kristal et al. (1995) reported data from the baseline survey of the Working Well Trial, which included 16,287 respondents. The researchers measured predisposing factors (belief in diet-disease relationship, perceived benefits of a healthy diet, and motivation to attempt a more healthful diet) and enabling factors (perceived barriers of healthy diet, perceived norms, and social support) and compared them to healthful dietary consumption of fat, fiber, fruits, and vegetables. Both predisposing factors and enabling factors for adopting a healthful diet were associated with current diet, intention to change, and self-efficacy. The predisposing factors were stronger predictors of behavior than the enabling factors. The participant's beliefs in the importance and benefits of a healthy diet appeared to influence food choice the most.

Dittus et al. (1995) found perceptions of a susceptibility to cancer and a concern for nutrition were positively correlated with healthy nutrition behavior indicating that a fear of disease may encourage fruit and vegetable intake. It is important to note that in this study, despite health concerns participants who indicated barriers in cost, availability, family acceptance, or concern about agrochemicals made fewer healthy dietary choices.

Hertzler and Frary (1996) conducted a survey with 305 college students to determine how personal and family characteristics were associated with their fat intake. The researcher found that subjects who indicated eating when blue had higher fat intakes indicating mood is associated with fat consumption.

Other Influences In the mid-1980s the Federal Trade Commission (FTC) and Federal Drug Administration (FDA) relaxed regulatory policy which allowed private food firms to make “truthful and not deceptive” claims in food advertising and labeling. As a result, health claims increased as food producers began to place emphasis on the nutritional importance of their products. Research conducted by the FTC indicated that improvements in dietary behavior (related to fat and cholesterol) increased rapidly after this period. The evidence suggested that advertising had significant effects on behavior. Advertising dollars are primarily spent in television (80%) and magazines (10%). These materials are potentially ones with the most influence on consumers (Ippolito and Mathios 1996).

Knowledge about specific diet and health relationships was compared with the 3-day dietary intakes from the 1989-91 CSFII/DHKS (LSRO 1995). Those who were aware of diet and health relationships were more likely to consume a diet following recommendations for optimal health than those unaware of the relationship. Other studies have also found a positive association between knowledge and dietary behavior (Krebs-Smith et al. 1995, Hagdrup et al. 1998). However, research indicates nutrition knowledge alone is not a predictive indicator of healthy dietary behavior (Nestle et al. 1998).

According to consumer surveys report, taste is the main influence of food selection (FMI 1996). Drewnowski (1997) summarized various studies on taste preferences and food choices. Foods containing both sugar and fat are universally preferred and those that are bitter are commonly disliked. Familiarity and sweetness

often direct food preferences in childhood. Children commonly dislike bitter foods such as broccoli. Research indicates the sensitivity to bitter taste has a genetic link. Studies assessing an individual's ability to taste bitter flavors have used solutions of phenylthiocarbamide (PTC) and propylthiouracil (PROP) and found they taste bitter to some and tasteless to others. People who taste PTC tend to avoid cruciferous vegetables such as broccoli, cabbage and brussel sprouts. Some food tastes can be learned and modified, and tastes once perceived as undesirable can become favorable when linked with a valued benefit, such as the healthy benefits of cruciferous vegetables (Drewnowski 1997).

Barriers

Not all individuals apply their knowledge to healthy dietary behaviors. It is important to discover what prevents a person who is aware of the need to eat adequately from doing so. Cotugna et al. (1992) analyzed data from the Cancer Control Supplement of the 1987 National Health Interview Survey completed by 22,043 adults. The authors examined nutrition and cancer-related knowledge, beliefs, attitudes, and self reported dietary changes. The primary reason 76% of respondents gave for not making dietary changes was enjoying the taste of the food in their present diet. Nearly 70% of respondents indicated that their diet was already healthy therefore they did not feel a need for any changes. This perception increased with age and decreased with income and educational level. Conflicting recommendations that caused uncertainty was the third most reported reason (48%) for not making dietary changes. Lower income and education level negatively impacted nutrition knowledge, attitudes, and beliefs.

Respondents with lower incomes and education levels reported more confusion with dietary recommendations and indicated expense as a barrier.

Urban et al. (1992) identified factors that promoted or discouraged the maintenance of a low fat diet in 408 women who had been offered the low-fat dietary intervention program in the Women's Health Trial. The women were given a questionnaire to identify six types of experiences that were expected to influence the maintenance of the diet. The perception of wellness while on the diet and the development of distaste for fat were factors that tended to indicate higher maintenance, although the relation was not significant. The feeling of deprivation and cost with respect to both time and money were significant deterrents to maintenance of a low-fat diet with the feeling of deprivation being the strongest. Neither inconvenience of the diet outside of the home nor lack of social support affected the maintenance of the diet.

Hagdrup et al. (1998) reported that almost 82% of respondents indicated some barriers to eating healthy foods. The most frequently reported barriers were confusing dietary recommendations, expense of healthy foods, and increased time and effort associated with preparing healthy foods. Similarly, Dittus et al. (1995) found preparation and cost were barriers to fruit and vegetable consumption. Hagdrup et al. (1998) compared perception data to actual intake and found that individuals who indicated more barriers to eating healthy had significantly lower daily fruit and vegetable intakes. The barriers significantly associated with low fruit and vegetable intake were time and effort associated with preparing healthy foods and eating out frequently. In Europe, Lappalainen et al. (1997) found the most common barriers indicated by subjects were

lack of time which included the statements “busy lifestyle” and “irregular working hours” and self-control which included “willpower” and “giving up foods that I like”.

In the study by Dittus et al. (1995) where individuals who indicated a healthy and susceptibility to cancer and a concern for nutrition made healthier food choices, the barriers were more strongly related to nutrition behavior than perceived benefits. The researchers noted that health concern might be diminished by a person’s perception of barriers to performing a particular healthy dietary behavior. In this same study, lower education and income groups indicated more barriers to intake of fruits and vegetables than upper education and income groups.

Using the Health Belief Model to design focus group questions, 5 A Day Program researchers used focus groups to gather information on barriers to eating fruit and vegetables (Heimendinger and Van Duyn 1995). The analysis of the focus group discussions indicated perceived barriers to fruit intake were “their perishable nature and when purchased out of season their expense and variable quality “ (Heimendinger and Van Duyn 1995, p.1398S). Preparation time was perceived as a barrier to vegetable consumption. For cruciferous vegetables such as broccoli, taste was a perceived barrier for their intake among focus group participants.

Misconceptions may contribute to undesirable dietary behaviors and serve as barriers to improved intake. In a convenience sample of 605 college students, Cypel and Prather (1993) found that food items high in starch such as pasta, potatoes, rice and bread were viewed as relatively bad for you, high in calories, more processed and not nutritious. The authors suggest that the students believed that the energy value of these

starchy foods makes them bad for you without regard for their fiber, vitamin, or mineral value. In 1987, the National Health and Medical Research Council (NH&MRC) conducted a study in North England. In interviews conducted in North England, when individuals defined healthy and unhealthy eating, a number of different interpretations were found (Povey et al. 1998). The definitions were reflective of the dietary recommendations suggesting that these people were generally knowledgeable about healthy and unhealthy eating. However, the inability by a person to accurately assess one's diet could prevent proper food intakes. The results of a mailed questionnaire completed by 234 respondents in North England, suggested that individual perceptions of his/her intake might not reflect actual dietary consumption (Povey et al. 1998). Results of the behavioral and food frequency questionnaire revealed that of the individuals who perceived their diet to be healthy, half had an unhealthy intake and more than half who considered their diet to be unhealthy actually had a healthy intake. These results could stem from the many different perceptions of a healthy and unhealthy diet. For example, perhaps respondents perceived their diet as healthy because they didn't eat sweets or fast food; however, they still may not eat fruits and vegetables.

Promoting Dietary Change

For successful dietary change, eating habits that have developed over a lifetime require alterations that must be continued permanently beyond the short-term intervention (Nestle et al. 1998). A behavioral change can be quite complex, with a number of barriers contributing to the difficulty to modify and maintain those changes. Once a person makes a commitment to change, the benefits to making that modification must

outweigh any barriers (Nestle et al. 1998). Another barrier to achieving adequate intakes may be the denial by an individual of the need to change. In 1987, the National Health Interview Survey in the United States found that one of the main reasons 65% of the respondents had never made any dietary changes was that they believed their diets to be healthy (Cotugna et al. 1992). Similarly, the results from the Pan European Union Survey revealed 70% of Europeans believe their diets to be healthy and they do not need to make any changes even though very few meet guidelines (Kearney et al. 1997).

Brug et al. (1995) analyzed the psychosocial determinants of fruit and vegetable consumption. Telephone interviews were conducted with 367 individuals with a mean age of 46. Attitude toward fruit and vegetables, social influence and self-efficacy beliefs were measured and each compared to behavioral intention to consume boiled vegetables, fruit, and salad. Attitude variables included individual perceptions about general health consequences, taste, vitamin content, digestibility, stimulating weight loss, pesticide and nutrient content, relieving hunger, price, and time to prepare. Attitude and self-efficacy were significantly correlated with intention to consume boiled vegetables, fruit, and salad with self-efficacy having the strongest effect. Social influences were significantly associated with the intention to consume only salad.

Many researchers have used the Stages of Change Model to study influences on food choices. The basic idea of this theory is that individuals are at varying levels of readiness to change (Glanz and Rimer 1997). Five stages are identified in the Stages of Change Model: pre-contemplation (not considering behavioral change), contemplation (considering change), preparation (planning change), action (implementing plans for change), or maintenance (continuing desired behaviors) (Glanz and Rimer 1997).

Psychosocial determinants such as attitudes, social influences, and self-efficacy expectations differ across stage of change (Brug et al. 1997). Significant differences in fruit and vegetable intake and psychosocial factors were found by Brug et al. (1997) between subjects in different stages. Attitudes toward healthy eating have been found to be low in the pre-contemplation stage (Brug et al. 1997, de Graaf 1997). Influences on food choice are different between individuals at different stages of change. de Graaf (1997) found subjects in pre-contemplation were more influenced by taste and less interested in health than subjects in the maintenance stage whose food choices were more health driven.

Results from Brug et al. (1997) indicated persons at different stages of change for fruit and vegetable intake need varying types of information to move them to the next level closer to desirable dietary modifications. The researchers suggest that providing information on the benefits of fruits and vegetables could be more stimulating for people in pre-contemplation to start contemplating higher intakes. In the same study, self-efficacy expectation for increased fruit and vegetable intake had the greatest increase between preparation and action stages leading the authors to indicate that people will only begin making changes when they feel confident in their ability (Brug et al. 1997). People who are ready for change need nutrition information revealing easy and convenient ways to increase fruit and vegetable intake that requires little time and effort and focuses on enhancing self-efficacy. Nutrition education material and programs are more likely to impact a greater number of people when they include information to reach people at all stages of change.

People can be targeted based upon their perceived benefits of the behavior. Among European adults, the main perceived benefits associated with eating healthy were to stay healthy (67%), prevent disease (66%), control weight (53%), be fit (53%), and improved quality of life (45%) (Zunft et al. 1997). However, reported beliefs about healthy eating did not necessarily reflect eating behavior of Europeans. To better understand the influences of dietary behavior, social factors and situations need to be taken into account as well.

Targeting the group of individuals and learning about their situation has the potential to provide a more successful intervention. Exceptions to general trends that were found by Hunt et al. (1997) led the authors to point out the need for nutrition assessment of specific populations. Likewise, Zunft et al. (1997) reported wide geographical variability and a lack of overall consistency with geographic areas of the European Union. This variability led the authors to suggest that strategies should be focused on precise targets.

Reed et al. (1998) conducted five focus groups with Vietnamese mothers living in the U.S. to discover barriers to calcium intake and identify effective ways for initiating dietary changes. Both their culture and the new environment played roles in their perceptions regarding food. The Vietnamese women stated that videotapes, recipes and brochures would be effective ways to influence change. In order to try new recipes however, the Vietnamese mothers indicated the need for the recipes to be “easy, fast, cheap, delicious and nutritious” (p. 159). Nutrition education materials need to be clear and to the point. “American foods” such as hamburgers and pizza were purchased because they took less time to prepare and were desired by their children.

Kristal et al. (1990) evaluated behavioral measures of dietary patterns related to the selection of low-fat food. The researchers developed a questionnaire to assess four dimensions of dietary behavior; these dimensions included substitution, modification, replacement, and exclusion. Substitution is maintaining similar dietary consumption but modifying it to incorporate the desired change. For example, by substituting skim milk for whole milk the diet is lowered in fat. Modification is the altering of high-fat foods to decrease the fat intake, for example, removing fat from meat. Replacement describes the replacement of high-fat foods with low-fat foods. Exclusion is the elimination of a food high in fat to decrease fat in the diet. All four dimensions were significantly correlated with percentage of calories from fat. Exclusion and replacement were the most significantly correlated.

Social Cognitive Theory

Theories and models of health behavior can play an important role in promoting dietary change by explaining behavior and suggesting ways to achieve change (Glanz and Rimer 1997). Interventions that focus solely on increasing nutrition knowledge and changing attitudes will be less effective in promoting dietary change (Harris and Murray 1997). A multidimensional approach is needed.

The Social Cognitive Theory (SCT) was first introduced by Bandura and addresses both the psychosocial dynamics affecting health related behavior and the strategies of promoting behavioral change (Baranowski et al. 1997). The key constructs of the SCT used for the focus group development were taken from Glanz and Rimer (1997) and Baranowski et al. (1997). The constructs are labeled as reciprocal

determinism, situation, reinforcement, expectations, self-efficacy, behavior capability, and observational learning.

The SCT postulates that environmental factors, personal characteristics, and behavior interact to shape individual actions (Bandura 1986). The simultaneous and continued interaction of those factors is labeled as *reciprocal determinism*. Personal characteristics of an individual include instincts, drives, traits, and other motivational factors within an individual. The environment refers to the physical, social, and institutional factors affecting behavior. Behavior, the final domain of reciprocal determinism, is the action taken by an individual. The three domains interact and a change in one affects the others. The concept of reciprocal determinism in the SCT guides the formation of the other constructs that are important in understanding health-related behavior (Baranowski et al. 1997).

Specific examples of environmental influences include such factors as availability, price, and family preferences. A person's perception of the environment guides thinking and behavior and is labeled as *situation*. For example, an individual who perceives vegetables as difficult to prepare or expensive would probably avoid consumption. Discovering and correcting misconceptions will help enforce the desired behaviors (Baranowski et al. 1997).

Reinforcements, whether positive or negative, are the responses to behavior that influence the reoccurrence of a particular behavior (Baranowski et al. 1997). Each individual holds *expectations* including anticipated outcomes of a particular behavior, which are learned by previous personal experience, observation of others, hearing about situations of others and emotional or physical responses to behaviors. The values that

individuals place on the learned expectations or reinforcements influence their behavior. Assessment of values placed on an outcome lead to identifying appropriate motivations for change since the value an individual puts on a particular outcome influences action. For example, a person may be aware of a disease and diet relationship but not fear it; therefore, it would not influence that person's intake. To further explain, some individuals may place more value on short-term benefits to dietary improvement and therefore, may be more motivated to make changes than long-term benefits.

The *behavioral capability* construct is the knowledge and skill necessary for a particular action (Baranowski et al. 1997). An individual must be aware of the appropriate behavior and how to perform it. For example, providing information on adequate folate intake should include sources of folate and methods to incorporate those sources into the diet.

People often learn appropriate behaviors by observing others. The *observational learning* construct refers to learning by observation of other's actions and the outcomes that result from that action (Baranowski et al. 1997). Children often learn eating and cooking behaviors by observing parent's actions and lifetime choices.

Self-efficacy is a key construct of the SCT that refers to the person's confidence in overcoming difficulties to performing a particular behavior or activity (AbuSabha and Achterberg 1997). If a person feels confident about their knowledge and their ability to make appropriate change, they will be more likely to make and maintain dietary modifications. An intervention has the potential to be more effective if it helps to identify anxieties and offer solutions for dealing with them.

Research Using SCT

Harris and Murray (1997) investigated how well a social cognitive model could explain variation in fruit and vegetable consumption. Surveys were completed by 132 females and 59 males taking a physical education class at Middle Atlantic State University. The questions were designed to measure social cognitive variables representing different environmental and personal factors. Thirty-three percent of the variation in fruit and vegetable consumption was explained by nine of the social cognitive model variables. The most significant variables associated with increased intake of fruits and vegetables were the perceived availability, lack of influence of price on the purchase of fruits and vegetables and a habit since childhood to eat fruits and vegetables. Students who reported a higher fruit and vegetable consumption also significantly reported liking the taste, noticing posted information, recognizing the importance of fruit and vegetables, having confidence in choosing them, and having adults in their family chose to eat fruits and vegetables when hungry. Individuals found to be in the action or maintenance stages of change also reported more intake than those in the precontemplation, contemplation, and preparation stages.

Using the SCT as the framework, Harnack et al. (1997) analyzed psychosocial and environmental influences on dietary behavior. Harnack et al. (1997) analyzed data from the 1992 National Health Interview Survey Cancer Epidemiology Supplement to determine whether cancer prevention-related nutrition knowledge and beliefs corresponded to dietary behavior. The researchers also wanted to determine how social status and perceived barriers to eating healthy affected the relationship of knowledge and behavior. The results suggested that both social status, measured by educational level,

and perceived barriers potentially influenced the dietary behavior of individuals more than knowledge. When controlling for age, sex, and perceived barriers, intakes of fiber, fruit and vegetables increased with an increase in knowledge. However, for those with lower educational levels, there was a lower association between knowledge/beliefs and dietary behavior. The association of knowledge and beliefs was also weaker for those who perceived a barrier to eating a healthy diet. Individuals who did not perceive barriers had mean intakes of fat, fiber, fruit and vegetable closer to dietary recommendations than those indicating barriers. Not tasty, not easy, and lack of support were the barriers to eating a healthy diet that were associated with lower intakes of fiber, fruit and vegetable intakes.

Kirby et al. (1995) conducted focus groups with 4th and 5th graders, parents, and food service workers in six different schools from three geographical regions. The focus group questions were developed using the three reciprocal determinism domains of the SCT (environmental, personal, and behavioral characteristics). Environmental factors were different across regions. Middle to high-income groups reported the availability of a larger variety of fruits and vegetables in their homes. The low-income groups indicated the use of more frozen and canned fruits and vegetables, and usually only the child's favorite fresh fruits and vegetables were available at home. Children ate at fast food and buffet style restaurants frequently. Children did not choose to eat fruits and vegetables when eating out unless at a buffet style restaurant or full-service restaurant. The adults believed children mimicked the eating patterns of their peers and parents but children did not. Personal characteristics differed by income levels, regions, and adult-child factors. Higher income groups reported a larger variety and more exotic fruits and vegetables as

their favorites. Very low and low-income groups perceived fresh fruits and vegetables as expensive. Children felt vegetables tasted “nasty” and fruits tasted “good”. All groups indicated children preferred candy, cookies, chips, and soda for a snack. The children felt their parents forced them to eat fruits and vegetables.

The SCT of health behavior can play an important role in promoting dietary change by explaining behavior and suggesting ways to achieve change. The use of the SCT in structuring and evaluating the focus groups will help identify and understand the factors that influence dietary behavior. Dietary behavior is complex and influenced by many factors. Other studies have indicated time, price, and availability as top environmental influences. The personal perceptions of taste and health benefits of food items have also been found to influence dietary behavior.

In our study, the SCT was used to design questions for focus groups to identify factors affecting women’s perceptions of food choices. The objectives of this research project were to use focus group discussions to determine childbearing age women's perceptions of (a) folic acid, vitamin supplements and a healthy diet; (b) influences on their food choices; (c) barriers to eating a diet adequate in fruit, vegetables and grains; and (d) motivations for dietary behavior change. We also attempted to obtain the women’s ideas on strategies for nutrition professionals to use in improving fruit, vegetable and grain intake in women who may not be meeting the recommendations for folate intake.

METHODOLOGY

This research project using focus groups is the first part of a large project titled Enhancing Prevention of Neural Tube Defects in Oklahoma and funded by Oklahoma Center for the Advancement of Science and Technology (OCAST). The responses of the focus groups will be used to develop a questionnaire that will be mailed to 2,500 women (18-44 years old) in Oklahoma to confirm the information identified in the focus groups; the questionnaire is not included in this study.

Focus Groups

Focus groups are an effective research method for generating personal perceptions. Focus groups consist of a small group of participants who are representative of a target population. The small homogenous group of individuals provides a relaxed environment to obtain in-depth perceptions and attitudes (Shepherd and Achterberg 1992). A focus group is small enough to allow everyone the opportunity to share ideas but large enough to provide a range of perceptions. Respondents can clarify and build upon others' responses in the group (Betts et al. 1996). Questions are planned and asked by a trained interviewer. The structured interview script serves as a guide for the researcher to cover all areas of interest. The open-ended questions generate respondent guided answers and discussion. Focus groups are repeated several times with new subjects each time to identify trends and patterns in perceptions (Krueger 1994).

The focus group method of data collection was chosen for this research because it provided useful information on individuals' points of view. Compared to more quantitative forms of data gathering, focus group methods allowed the respondent to play more of an active role and the researcher a less dominant role (Betts et al. 1996). The flexible means of data collection gives focus group interviews an advantage in dietary behavior research and has the potential to improve nutrition interventions.

Specifically for this project, focus group discussions were conducted to determine women's perceptions of the following: their beliefs and attitudes about folic acid, vitamin supplements and a healthy diet; influences on their food choices; barriers to eating a diet adequate in fruit, vegetables and grains; and motivations for dietary behavior change. Another objective of the project was to obtain the women's ideas on strategies for nutrition professionals to use to improve fruit, vegetable and grain intake in women who are not meeting the recommendations for folate intake. Interviews were conducted following the procedures outlined by Krueger (Krueger 1994). The focus group meetings were approved by the Oklahoma State University (OSU) Human Subjects Review Board and were held at the University during the months of October and November of 1998. The human subjects review form is located in Appendix A.

Subjects

Oklahoma women of childbearing age (18-44 years old) were recruited from the Stillwater area. Fifty-seven women were recruited for the focus group study. To be included in the study, the women could not be pregnant, dieting for weight loss or have a

chronic disease that affects dietary intake. The subjects were screened using the form located in Appendix B.

Subjects were recruited in the Stillwater area through the use of advertisements placed in the Stillwater NewsPress and the Daily O'Collegian. Participants were also recruited by sending fliers through campus mail to all Oklahoma State University (OSU) female staff members who worked half time or more. Copies of the flier and newspaper advertisement are located in Appendix C and D. The volunteers were screened and then scheduled for a focus group interview by phone. Care was taken to avoid including friends in the same group. Ten volunteers were scheduled for each focus group interview. A reminder phone call was made the day before the scheduled interview time. A minimum of four women had to be present to conduct the focus group discussion (Krueger 1994). Each focus group consisted of six to ten participants who were representative of the target population.

Transcript Development

The structured interview script served as a guide for the moderator to elicit the women's perceptions and meet the research objectives (See Appendix E). Questions were systematically generated using the Social Cognitive Theory (SCT) as the theoretical framework. The SCT concept of reciprocal determinism postulates that environmental factors, personal characteristics, and behavior simultaneously and continually interact to shape individual action (Bandura 1986, Baranowski et al. 1997). The three factors guide the formation of key SCT constructs important in the understanding of health related behavior (Baranowski et al. 1997). Environmental, personal and behavioral factors were

studied with the development of detailed open-ended questions using key constructs of SCT. This complex theory includes many concepts that are important to understanding health-related behavior including the environment, reinforcement, expectations, observational learning, behavioral capability, and self-efficacy (Baranowski et al. 1997, Glanz and Rimer 1997). A detailed explanation of the SCT and its constructs can be found in the Literature Review.

Questions regarding influences on food selection were asked to generate information on all three domains of the SCT. Subjects in all of the groups were then asked a set of questions about each of the food categories known to be high in naturally occurring folate or fortified with folic acid: fruit, vegetables and grains. For example, the group was asked why they ate fruit, how important it is for them to include fruit and what prevents them from consuming more. This line of questioning was repeated for vegetables and grains to give insight on the three SCT domains for each specific food category. Each focus group was then asked questions dealing with dietary changes they had tried to make in the past. Specific questions referring to motivation, the success of changes and personal rewards for success were developed to give insight into personal characteristics and behaviors.

Following the dietary change questions, each group was asked for their suggestions for educating women about the importance of eating fruit, vegetables and grains. The moderator probed for the type of information to include in education and what would get them to follow the advice. The next line of questions dealt with knowledge about folate, it's role in disease prevention and food sources. The moderator asked if awareness of the role of folates in disease prevention would affect their intake.

The focus group leader then showed the group a poster of five foods naturally high in folate or fortified with folic acid. The visual included pictures of orange juice, spinach, dried cereal, pasta and kidney beans. A set of questions was asked to determine which of the pictured foods individuals would be more willing to add to their diet and personal perceptions of influences on the consumption of those specific foods.

The final questions dealt with attitudes and beliefs about vitamin supplement intake. The moderator asked the group about their feelings on supplements, whether they would prefer to increase folate through food or supplements, and why.

Pilot Group

One pilot focus group was conducted with several individuals in the target group to test the interview questioning guide. A pilot serves to ensure the following: effectiveness of the sequential flow of questions, understanding of each question by participants, adequate time allocation for questioning, and the generation of the desired information to meet research objectives (Shepherd and Achterberg 1992, Krueger 1994). Based on the observations of the pilot group, small adjustments were made to the interview transcripts. A few of the questions were reworded for clarification. A poster was added for visual representation of food items containing folates. The pilot group was also used to increase the efficiency with which the moderator asked the questions.

Data Collection

Focus Group Staff

The focus group staff consisted of a moderator and an assistant. The moderator directed discussion using the interview script; the assistant took comprehensive notes of the responses and operated the video and audio equipment. The moderator of the focus group was a doctoral student in Nutritional Sciences. Training included attendance at a workshop on conducting focus groups that was based on Krueger's methodology (Krueger 1994). The assistant, the author, was a master's student in Nutritional Sciences. Training of the assistant included reading Dr. Krueger's text (1988) and listening to audiotapes of other focus groups that had been conducted on nutrition issues.

Focus Group Procedures

All participants received a full explanation of the study, were given time to ask questions and then signed informed consent forms (See Appendix F). The meeting was held in a conference room with the chairs arranged in a circle so all participants and the focus group moderator could be seen and heard by one another. The focus group questioning began ten minutes after the scheduled meeting time. To prevent distractions, subjects arriving after the moderator began data collection were not allowed to participate.

At the onset of questioning, the moderator stated that the questions did not contain right or wrong answers and the participants were encouraged to state their opinions openly when responding to the questions. After asking each question, the participants were allowed to direct their responses while the moderator took a passive role during

discussion among group members. If discussion began to shift to an unrelated topic, the moderator would restate the original question or move on to the next question. The moderator did not state her personal opinions through verbal or nonverbal communication. At the conclusion of the group discussion, the subjects received a \$10.00 payment and were thanked for their participation. A snack was served while each of the group members completed a demographic sheet. A sample of this document is located in Appendix G. As part of the larger OCAST project, a 24-hour recall was conducted for each of the group members, three-day food record instructions were given, and subjects completed a food frequency questionnaire (FFQ). The 24-hour recall, food records and FFQ data are not part of this discussion of the focus groups. The same procedure was utilized for each of the seven groups.

Data Analysis

The audiotapes were transcribed verbatim by the OSU Bureau for Social Research. The transcript for each tape was typed on a computer using word processing software. One of the focus groups could not be transcribed due to equipment failure during taping. The notes taken by the assistant moderator were used for analysis.

The moderator and assistant moderator reviewed the printed transcripts for accuracy by listening to the tapes. Corrections were made to the transcripts. Working independently, the moderator and assistant moderator identified major themes from the printed transcripts of three of the groups. The other four groups were coded by the assistant moderator only. Categorizing the text through the use of an analysis sheet identified themes. The analysis sheet was modified from Krueger's book (1994) and an

example is placed in Appendix H. For each question, code words were used to categorize responses. The code words were placed in the left column of the analysis sheet and individual quotes falling within that typology were recorded in the right column of the analysis sheet. Once categorized on the analysis sheet, the tapes were reviewed again to check the analysis sheet for accuracy. After listening to each tape a second time, summaries were prepared including highlights and impressions by the researchers. Guidelines for analysis from Krueger's text (1994) were followed.

The code words for each group were discussed among the moderator, assistant, and the principal investigator to establish agreement of typology development. No major discrepancies existed between researchers; only minor adjustments were made to a few code words to increase agreement. A list of code words was developed and a description was written for each of the code words (See Appendix I). The assistant moderator used the list of typologies to code the lines on the transcripts. The coded transcripts were then compared to the analysis sheets to check for reliability of coding. Intra-rater reliability was 89%. Reliability was calculated by code word/factor agreement. The total number of agreements and disagreement were divided into the number of agreements.

The coding enabled the identification of factors influencing dietary behavior. Themes were identified based on the frequency with which factors were mentioned across the groups. An inductive research approach was used to describe the results.

CHAPTER IV

RESULTS

Subjects

Seven focus groups were conducted with 57 women of childbearing age. The groups consisted of 6 to 10 women with an average of 8 participants per group. The 57 participant's ages ranged from 19 to 44 with an average age of 31 years (Table 1). Fifty-three of the subjects were white. Sixteen of the women lived alone, and 33 (58%) of the women lived with one other adult in the home. Thirty women did not have any children living with them; 27 indicated one or more children living in the home. Thirteen women were full-time students, and most (n=39) were not current students. The majority (n=41) of the women were employed full-time. Twelve were employed part-time, one was a homemaker, and three were unemployed. For the highest level of education obtained, four participants indicated high school/GED, 16 had some college or technical school training, 36 (63%) graduated from college with 11 of those completing graduate school. Almost half (n=26) were employed in clerical or sales work. Twenty-four individuals labeled their paid work as professional or technical. Fourteen of the participants indicated income from all sources over the past year under \$15,000, 12 indicated making between \$15,000 and \$24,999, 13 took in between \$25,000 and \$35,000, and 18 made over \$35,00 from all sources of income.

Forty of the 57 women in the focus groups recorded that they ate a normal diet. Four followed a weight gaining diet, two followed a vegetarian diet, two others recorded

following a weight reduction diet, three indicated a low fat/low cholesterol diet, one followed a low sodium diet, and one other a high fiber diet. One woman specified a diet of more protein and less carbohydrate. Another participant said she consumed a low carbohydrate diet. Two other participants specified a combination of the listed diets with one indicating both low fat and low sodium, and the other woman reporting a low fat, low cholesterol and high fiber diet.

With regard to supplementation, 24 (42%) individuals took supplements regularly, 18 took supplements but not regularly, and 15 did not take any supplements. Of the 42 individuals who indicated supplement usage, 38 of them reported taking multivitamins, which most likely contain folic acid. Two women indicated taking a folic acid supplement along with the multivitamin. Two other women reported taking a B-complex supplement. One of those women was also a multivitamin user and one was not.

The median body weight of the participants was 145 pounds. Over two thirds of the women were not happy with their weight with 28 of the women being unsatisfied and 12 very unsatisfied. A complete demographic information table is located in Table 1.

Influences on Food Choices

A theme that dominated the conversations in all groups relating to food choices was time. The women mentioned frequently that their busy lifestyles affected the types of food chosen. There was little time to prepare meals, so items that were considered convenient in terms of availability, ease of preparation and quickness of preparation were more likely to be eaten. Some comments included "I am so tired when I get home from

Table 1. Focus Group Demographic Information

Characteristics	Minimum	Maximum	Mean	Median
Age (in years)	19	44	31	---
Height (in inches)	60	71	65	---
Weight (in pounds)	103	330	154	145
Number of Other Adults				
Living in Household	n	%		
0	16	28		
1	33	58		
2	7	12		
3	1	2		
Number of Children living in household				
0	30	53		
1	15	26		
2	9	16		
3	3	5		
Student Status				
Full-time	13	23		
Part-time	5	9		
Not a student	39	68		
Highest Level of Completed Education				
High school graduate/GED	4	7		
Some technical school/some college	16	28		
Technical school degree	1	2		
College graduate	25	44		
Graduate	11	20		
Current Work Status				
Employed full-time	41	72		
Employed part-time	12	21		
Homemaker	1	2		
Unemployed	3	5		

Table 1. Cont.

Race	n	%
White	53	93
Black	1	2
American Indian/Alaska native	2	4
Hispanic origin	1	2
Other	1	2
Income from all Sources		
Over the Past Year		
Under \$10,000	7	12
\$10,000 - \$14,999	7	12
\$15,000 - \$19,999	11	19
\$20,000 - \$24,999	1	2
\$25,000 - \$29,999	6	11
\$30,000 - \$34,999	7	12
\$35,000 - \$49,999	9	16
\$50,000 and over	9	16
Description of Paid Work		
Professional or technical	24	42
Manager, officer or proprietor	3	5
Clerical or sales worker	26	46
Service worker or similar job	2	4
Other	1	2
Supplement Usage		
No	15	26
Yes, fairly regularly	24	42
Yes, but not regularly	18	32
Supplement Types Taken		
Multivitamin	38	67
Vitamin E	1	2
Other	4	7
Multiple response	7	12
Weight Satisfaction		
Very satisfied	5	9
Satisfied	12	21
Unsatisfied	28	49
Very unsatisfied	12	21

Table 1. Cont.

Current Diet	n	%	
Normal/general	39	68	more than any other
Weight reduction	2	4	over 100%
Weight gaining	4	7	
Low fat/low cholesterol	3	5	
Low salt/low sodium	1	2	
High fiber	1	2	
Vegetarian	2	4	
Other	5	9	

work I go after fast and convenient,” and “I work full-time and have two kids, so I usually have to consider how long it’s going to take to prepare more than any other factor.” As a result many families resort to fast food restaurants. However, some women indicated they tried to make an effort to cook meals at home because of a feeling of a responsibility to provide their children with balanced meals though this idea was not mentioned in all of the groups.

Personal preferences, including taste and cravings, were strong factors in deciding what to eat for subjects in six of the seven groups. In responding to questions related to influences on their food choices, women often stated, “what tastes good” as a means of deciding what to eat.

The women were asked how moods affected their food choices. Moods tended to be associated with poor food choices whether the mood was a good or a bad one. Likewise, the women indicated that the menstrual cycle influenced cravings for unhealthy foods such as chocolate and greasy food items. Boredom and sedentary activity such as television watching were associated with increased food cravings.

In all 7 groups, the women mentioned cost as a factor that played a role in food selection; however, when mentioned, the same individuals continued to bring it up throughout the discussion while others did not.

When asked about how other people influenced their food selection, a cohabitation effect appeared to exist. Individuals living with other people, whether their husband, children, roommate, or parents, were often influenced by the other’s food preferences. The women who were married or had children were particularly interested in pleasing their family members. The women tended to be primary purchasers and

preparers of food, and planning meals that were acceptable to the entire family was very important to many of the women even at the expense of their own preferences for some women. For example, one woman stated, “there is a lot I would love to eat, but you don’t fix all that for one person, so we end up eating what will please the majority.”

With regard to the probing for past childhood influences on food selection, the views were mixed. Some women, especially those who cooked an evening meal at home, indicated that they prepared many of the same traditional foods that “mom” had prepared when they were young. A couple of women indicated that their own preparation methods have changed by frying less often than they remembered their mothers frying food at home. Also, women indicated that they ate out more often now than when they were children. Others felt they were not influenced by their mother’s food habits when they were children. Interestingly, the women commonly mentioned that the foods they were forced to eat as children were often avoided now as adults.

Fruit Selection

In response to why they ate fruits specifically, craving and enjoying the taste of fruit were indicated as reasons participants in all the groups consumed fruit. Remarks were made that the season-related quality of fruits, especially during the summer months, influenced positive cravings and preferences for fruit. The health benefits were mentioned as an important factor that influenced consumption for women in 6 of the groups. Some comments implied that the knowledge of health benefits might not lead to consistent day to day intake for the majority. For example, comments included “I’ll eat fruit if I’m trying to be healthy,” “I just do it because they say you’re supposed to,” and

“if I’m eating fruit, I’m trying to make a conscious effort to be healthy.” Unfortunately, barriers to fruit purchase and intake seem to dominate a majority of the discussion on fruit selection.

Including fruit in the diet required a lot of effort for many women. Central themes of barriers to fruit consumption arising in all groups included season, price, availability, taste, spoilage rate, and inconvenience of preparation. The women felt fruit intake was limited in their diet due to changing seasons. The winter months were associated with decreased cravings for fruit as well. Many were reluctant to purchase fruit in the grocery stores because of inconsistent quality, which was sometimes related to season but sometimes not. A few statements included “you never know about quality,” “half of the time you waste your money,” and “if I buy them at the store, there is no flavor in them.” Cost was perceived as a barrier in all the groups. Some group members put more emphasis on cost than others did. For those who eat out frequently, the lack of availability of fruit at restaurants was a factor that limited intake. Women from five groups implied spoilage rate as a factor that limited the purchase of fruits through statements such as “they go bad quick,” “it rots in the drawer,” and “I do not buy them because they rot.”

Fresh fruit, especially oranges were perceived as inconvenient to some members in 5 of the focus groups due to the messiness and effort of preparation. It is important to note that a couple of people mentioned perceiving fruit as easy and convenient, but it was not mentioned frequently across the groups.

Vegetable Selection

English | 11/15/2014

Subjects in a couple of groups emphasized vegetables as being easier to include in their diets than fruit. For incorporating vegetables, preferences for taste and health benefits of vegetables were influences that arose most across the groups. Taste was mentioned the most often within the groups. Related to the health benefits, serving as a positive role model for children was mentioned as a reason for the preparation of vegetables in 3 focus groups.

There seemed to be a traditional role of vegetables as part of the evening meal, which was inferred in 4 of the groups. Quotes from the women included "You are just used to having your meat, potato, and vegetable," "It was something I grew up eating. I had to have one at every meal," and "It goes back to the way I was raised. It was always bread, meat, and vegetable." The evening meal seemed to be the most common time for a vegetable to be eaten.

The ease of preparation of vegetables was mentioned as a factor that added to the intake of vegetables for women in 4 of the groups. For those women who incorporated vegetables into their diet consistently, they seemed to perceive it as convenient for them to do so; however, more women in the groups considered vegetables to be inconvenient. It appeared that women who cooked meals at home for their families found vegetables to be more convenient and easy to prepare than women who did less regular cooking. When time was an issue and the women were looking for something quick to grab or did not feel like cooking, other food types were perceived as more convenient and were chosen over vegetables. Depending on lifestyle, lack of time to prepare or availability became barriers to consumption. For example, in one group there was group agreement when one

woman made the following comment relating to the availability of vegetables, "They do not sell in vending machines, and you can't order [them] from fast food restaurants."

There seemed to be many conflicting views regarding perceptions of reasons for limited intake of vegetables. Common themes were not obvious among all the groups. A personal dislike for the taste of vegetables came up as a barrier by at least one person in 5 of the groups. In 3 groups, husband and children's preferences were mentioned as a barrier that limited vegetable variety. This was implied by such statements as, "kids will only eat three or four different kinds," "husband won't eat unusual vegetables," "family is so picky," "broccoli is the only thing all three of us will eat." Individuals mentioned spoilage rate as a factor that limits intake of vegetables in two of the groups.

Grain Selection

Nearly all the women in every group perceived grains as being more adequate in their diets than either fruits or vegetables. The common themes of factors promoting grain selection were taste, convenience, availability, and traditional role in the diet. The good taste was indicated as a driving factor in the selection of grains. They were also perceived as convenient to consume, requiring little preparation and readily available. The women perceived grains as a traditional part of the diet that contributes to habits. Comments suggesting this include, "it is not real hard (to include grains)," "it's cultural...goes with the American diet," and "seems like a base of the meal."

Although not identified as major themes, there were other perceptions of grains worth mentioning. The inexpensive cost of some grain products arose as a positive effect on purchases in three groups. Three other groups mentioned that the versatility of bread

makes it easier to include in their diets. The perception of grains as filling by members in three groups leads to a feeling of satisfaction when consumed.

Two themes arose as factors that prevented the addition of more grains to their diet. The women tried to limit consumption because of the attitude that their diet is already adequate in grain intake and the association of carbohydrates with weight gain.

Motivations for Changing Diet

Weight and health issues were mentioned most as factors that have motivated individuals to make dietary changes. Dissatisfaction with weight was mentioned in all but one group as the primary factor that had motivated dietary changes in the past. Their comments included “I’d rather be skinny than healthy,” “I’ve been motivated by weight a lot of times but not enough,” and “looking in the mirror [motivates me].” Subjects in four of the groups mentioned personal health concerns as a motivating factor. Those who indicated actual family health problems mentioned that their personal experiences had lead to improved dietary choices and appeared to be more of a motivation for sustained changes. Comments reflecting this included “my parents have a lot of health problems...to eat healthier its worth it” and “my mom had a heart attack...big motivator for me—I didn’t even think about it before.”

A couple of other factors were mentioned as motivations to change the diet but were not themes across the majority of the groups. Pregnancy was mentioned as a reason to change dietary behavior in three of the groups. Women mentioned their increasing age had heightened their awareness and importance of eating healthy. Comments suggesting this were, “I’m 36 and it wasn’t until a few years ago that I realized the need to start

paying attention,” “I want to enjoy my retirement,” and “I want to be a healthy old person.”

Dietary Changes

Restriction of fat and calories and attempting to add fruits and vegetables were the most common changes made by the women. Substitution was used to make changes in their diet. Comments suggesting substitution included, “adding more vegetables and cutting out fat,” “substituting apple sauce for fat [in recipes],” and “try to buy whole grains instead of white bread.”

When the women attempted changes in the past, only a few subjects mentioned specific factors that led to their success. Themes were difficult to find across the groups. The strongest theme associated with success was the incorporation of small gradual changes, which was indicated by participants in four of the groups. This was reflected through comments such as, “slow changes are so much easier than all of a sudden” and “little tiny steps but still an improvement.” Some examples of small changes were adding one fruit a day, eating breakfast, eating less, cutting back on one unhealthy habit, and substituting an unhealthy food choice for another. One woman who had indicated making a lifelong commitment to change stated, “I mentally decided I was going to change my diet over the lifetime...it is not a quick fix. It is for the rest of your life.” Other factors associated with successful dietary changes that were infrequently mentioned were self-monitoring, meal planning, increased awareness, exercise, social support, and setting long term goals.

The women made several statements relating how difficult it was for them to make and maintain dietary changes. Suggestive statements were “its something you have to work at,” “I got sick of trying,” “it takes a lot of discipline.” Some of the women mentioned only having short-term success because of perceived difficulty in sustaining changes. Almost all of the women who responded implied that dietary changes required great effort and discipline. This perception of effort appeared to lead to failures or inconsistencies of attempted dietary improvements. The women also frequently mentioned a lack of persistence, which was reflected in the following statements: “I’m successful for a couple of days,” “I’m temporarily back and forth,” and “consistency is a problem.”

A dominant theme was that many women perceived eating healthy as inconvenient and time consuming. The lack of time was mentioned frequently by the women as a reason that they were not able to sustain desired dietary changes. Comments suggesting this barrier were “it takes more time to eat healthy,” “it is difficult to watch what you eat when you have a crazy schedule,” and “the busier I get, the worse my diet gets because I’m concentrating on other things.”

The factors below were not major themes, but were indicated as factors associated with making dietary improvements difficult. Members perceived making healthy dietary changes as expensive in four groups. Family preferences for other food choices were an obstacle for subjects in four groups. Obstacles mentioned less frequently but worth noting were habits, unavailability of healthy food items at restaurants, no visible results, and an unwillingness to change lifestyle. These barriers to making and sustaining dietary

changes are many of the same barriers mentioned in the discussion of factors that prevent fruit and vegetable consumption.

Personal Rewards

In response to the question of personal rewards for success, women most commonly chose unhealthy foods such as concentrated sweets as a reward for accomplishing goals for dietary improvements. Material rewards such as shopping for clothing items were also mentioned frequently. A few commented that feeling good and weight loss were rewards in themselves.

Suggestions for Nutrition Education

In response to the question on how nutrition professionals can improve dietary intakes of fruit, vegetables, and grains, the women suggested television commercials as the best way to make nutrition information accessible and influential. Their comments to ways nutritional professional could influence women included “it would have to be a good advertisement,” “I think TV has a lot to do with it,” and “we are very susceptible to commercials.” Subjects mentioned that the television advertisements promoting milk have increased their awareness of milk’s importance in the diet. Other suggestions of methods for advertising were highway billboards, coupons, grocery store posters, and in-store samples.

The women commonly recommended that nutrition information should be specific. The information should give details on the vitamins, types of food, benefits to eating those foods, preparation methods and techniques for incorporating the

recommended changes into a busy lifestyle. They want to know what to do, why they should do it, and how to do it. Comments reflecting the need for specific nutrition information included “give what vitamins you need, how much, and which vegetables have them,” and “if you eat this (specific food), your going to get this (specific vitamin).”

Other suggestions were to start young, focus on the responsibility to others (“if I don’t do this I won’t be around for my children or husband”), focus on the positive “instead of saying don’t do this and don’t do that”, and point out low cost items.

Some women indicated that they would be influenced by scare tactics about disease to frighten them into increasing their selection of folate-containing foods and other responses indicated that such tactics would not affect their behavior. It is discouraging to report that a few women in the groups stated that there is nothing that could be said or given to them that would have any affect on their dietary choices. They felt that plenty of nutrition information is already available regarding the importance of eating fruits and vegetables and for some it doesn’t affect their intake. Their comments included “its already out there,” and “its been presented to me since grade school.” Statements suggesting reasons that the information doesn’t influence their diets were “my health would have to actually be in jeopardy” and “it has to hit you personally.”

Some women in three groups expressed dissatisfaction with discrepancies in health recommendations and emphasized the need for consistent information. This feeling was expressed through comments such as, “it is confusing because we hear so many different things,” “there is something different every week,” “last week that caused cancer and this week (it will help you),” and “what is healthy today is not going to be tomorrow.”

Folate Knowledge

Someone in every group identified the need for folate during pregnancy and about half of those individuals mentioned its role in preventing birth defects. When asked what foods contain folate, green leafy vegetables were mentioned most often. Subjects from two different groups mentioned seeing commercials advertising orange juice as a source. In two groups, a subject mentioned cereal as a source. However, there was general uncertainty about folate overall. Most women were unsure of what it is, where it is found, and how much is needed.

Vitamin Supplements vs. Folate-Containing Foods

When asked to choose between a vitamin supplement and folate-containing foods to increase their folate/folic acid intake, the women's views were mixed. Twenty-seven women selected the food, 21 chose the supplement, and 5 women stated they would try both. The most frequently mentioned barriers to supplement intake were dislike of taking pills, forgetting to take, and the expense of taking. When given a choice among cereal, pasta, beans, orange juice, and spinach, the women stated orange juice as the folate-containing food they would be most willing to add to their diet primarily due to its convenience. Their comments were "its readily available and easy to get...it is simple for me," "it is quick and easy," "it is faster, easier, and convenient." Beans were the second most selected food item for various reasons (taste, protein, affordability, and already consuming other foods on the poster).

Definitions of Healthy and Nutritious

The participants were asked to define both a healthy and nutritious diet. The most common definitions for healthy were “to follow recommendations” based on the Food Guide Pyramid and to avoid fat. The common definitions for nutritious were that it provides nutrients and that it is synonymous with healthy. The women gave various definitions. Their comments included the following: “helps your system work,” “provides nutrients your body needs,” “a balance,” “low-fat,” “depends on what you are trying to accomplish such as weight loss, lower blood cholesterol, etc.,” “whole foods,” “not anything that taste good,” and “prevents diseases.”

DISCUSSION

Focus groups were conducted to obtain attitudes, beliefs, and opinions of women regarding their food choices with a focus on folate-containing foods. The use of the Social Cognitive Theory (SCT) in structuring and evaluating the focus group discussions helped to identify and understand factors that influenced dietary behavior. This complex theory includes many concepts that are important to understanding health-related behavior including the environment, reinforcement, expectations, observational learning, behavioral capability, and self-efficacy (Baranowski et al. 1997, Glanz and Rimer 1997). The following sections will look at what we found in relation to the concepts of the SCT.

Reciprocal Determinism

According to the SCT, the environment, personal characteristics, and behavior continually interact to shape individual actions and this key concept is defined as reciprocal determinism (Bandura 1986). To further explain, here is a prime example of reciprocal determinism from the focus groups. Since some women may avoid buying fruits because of spoilage, when they do have a craving it is not always available at the house which further limits intake. Lack of fruit cravings or preferences for fruit (personal characteristic) lead to decreased consumption (behavior) which leads to the spoilage of purchased fruit (environment), so individuals buy it less often (behavior) because of

spoilage rate. When the desire for fruit arises, it is often unavailable in the home (environment) because they avoided purchasing the fruit.

This concept of reciprocal determinism helps to understand dietary behavior and identify possible areas for influencing the diet. For this situation, until habits or preferences for fruit intake develop it may be more realistic to encourage intake of canned fruit products by emphasizing their convenience and shelf life. Canned fruits could be kept on hand so that when a craving for fruit occurs they are available to the individual at home. Suggestions for dietary change that consider the personal factors, behavior, and environment of the individual are more likely to lead to change in the person's dietary choices.

Environment and Situation

The *environment* is the interaction of physical, social, and institutional factors affecting behavior (Kirby et al. 1995), and a person's perception of the environment, which directs thinking and behavior. The environmental factors affecting the food choices of the women in this study were time, family preferences, cost, availability, and spoilage rate. For the women in the focus groups, busy lifestyles commonly influenced the amount of time to prepare food. Food items considered to be more convenient in terms of availability, ease of preparation, and quickness of preparation were more likely to be chosen among members from each of the focus groups. Most women considered the preparation of food as work, especially those working full-time jobs. Not only do they have to cook, but they also have to clean up afterwards; this contributes to the popularity for eating out especially at fast food restaurants. Most grains were perceived

as convenient to consume because women felt grains were readily available and required little preparation. Pasta was one grain that required more preparation time; this limited pasta intake for a few of the women.

Other studies have found ease of preparation to be important to women when selecting food (LSRO 1995, Betts et al. 1995). Betts et al. (1995) conducted focus groups across seven states and also found that busy schedules and lack of time impacted food consumption. Due to time constraints, foods that were convenient to prepare were chosen often, and in a discussion about cooking, slightly over 80% of the groups indicated a lack of desire to spend time preparing foods perceived as inconvenient (Betts et al. 1995). Dittus et al. (1995) found preparation to be a barrier to fruit and vegetable consumption. Heimendinger and Van Duyn (1995) found preparation to be a barrier only to vegetable intake.

Many women in our focus groups perceived eating healthy as time consuming, and their busy lifestyles prevented them from eating healthfully. Hagdrup et al. (1998) found that the increased time and effort associated with preparing healthy foods to be one of the most frequently reported barriers to individuals in a statewide Missouri study. Lappalainen et al. (1997) also found that busy lifestyles and irregular working hours were barriers to eating healthy. The time associated with meal planning and preparing was a primary deterrent to the maintenance of a low-fat diet for women participating in a follow-up study to the Women's Health Trial (Urban et al. 1992).

For some women in our study, the lack of availability of fruit and vegetables in restaurants was indicated as a barrier to their consumption although it was not a major theme. Krebs-Smith et al. (1995) found the perception of availability was significantly

related to fruit intake alone. Related to availability, the women indicated the lack of good quality fruit as a barrier to intake. The inconsistent quality was sometimes associated with seasonal changes, but sometimes not. Heimendinger and Van Duyn (1995) found that during off-seasons the expense and variable quality was a perceived barrier to fruit intake. Quality of food was important to subjects in other studies as well (Betts et al. 1995, Lernnemas et al. 1997, LSRO 1995).

Analysis of the DHKS (LSRO 1995) revealed food storage quality to be very important to most respondents. In the focus groups we conducted, spoilage rate was a barrier to the purchase of fresh fruit for participants in five of the groups. Similarly, Heimendinger and Van Duyn (1995) reported the perishable nature of fruit to be a perceived barrier to intake.

A couple of women mentioned spoilage rate as a factor that limited their intake of vegetables, also. It is surprising that this would limit intake because of the large amount of frozen and canned vegetables that are now available. It may be advantageous to promote the purchase of frozen vegetables to help some women overcome barriers. In addition to the spoilage barrier, the purchase and use of frozen vegetables in bags might overcome family preference barriers for women. Frozen vegetables could be a convenient way for them to take out a single portion for themselves if the family was unwilling to eat them.

The price of food items was influential in selecting food for some women in all of the groups. The same women tended to bring up price throughout the focus group discussion indicating that price was a less influential factor for the groups overall. Other

research has also found price to be a factor influencing food choices (Betts et al. 1995, Devine et al. 1998, Lennernas et al. 1997, LSRO 1995).

During the discussion on making dietary changes, expense was indicated as a barrier to eating healthy for only a few of the women. Hagdrup et al. (1998) surveyed individuals throughout Missouri and found price to be one of the most frequently reported barriers to eating healthy. Cotugna et al. (1992) found that those with lower income and educational levels indicated price as a barrier to making healthful dietary changes. Urban et al. (1992) found that women who perceived planning and preparing a low-fat diet to be costly were also less likely to maintain the diet after the nutrition intervention. In the discussion on fruit consumption specifically, the cost was frequently mentioned as a barrier to the purchase of fruit. Dittus et al. (1995) discovered cost as a barrier to both fruit and vegetable consumption.

When asked about the influences of others on their food choices, only a few women stated that a friend's preferences or food choices impacted their own. Brug et al. (1995) did not find social influence to be significantly correlated with the consumption of fruits or boiled vegetables. However, people living in the same household influenced many of the women in our focus groups.

Women who lived with others indicated that they were influenced by the preferences of these individuals. This indicates a cohabitation effect on food choices. The women who were influenced most strongly seemed to be the women with families. The women tended to do most of the purchasing and preparing of food for their families. Women who mentioned cooking full traditional meals were those who mentioned doing so out of a responsibility to their family. Traditional food items mentioned as part of a

meal were meat, a vegetable, and grain items such as pasta and bread. Women who cooked meals at home for their families seemed to find vegetables to be more convenient and easier to prepare than women who cooked less frequently.

For the women cooking for families, what the family preferred to eat was very important. If the spouse or children did not like specific foods, the women felt that it would be a waste of time to cook those foods. Family preferences were a barrier to increased vegetable intake by limiting the variety of vegetables. Research has found a dislike of vegetables by children to be common (Kirby et al. 1995). Planning meals that were acceptable to the entire family was important to many of these women, even at the expense of their own personal preferences or needs. Similarly, other studies have found that family influences play a role in food choices of individuals. Current family preferences played a major role in food selections for a representative sample of individuals in Europe (Lennernas et al. 1997). Devine et al. (1998) found role transitions such as childbearing and marriage influenced food choices.

Another powerful environmental influence in food intakes might be the media. In response to questions on how nutrition professionals can improve the intake of folate, the women indicated television advertising was a powerful and influential tool. A 1998 March of Dimes Gallup poll revealed that 19% of the respondents reported learning about folic acid from TV (CDC 1999). Research conducted by the Federal Trade Commission revealed that improvements in dietary behavior related to fat and cholesterol intake rapidly improved after firms began to place emphasis on the nutritional value of their food products (Ippolito and Mathios 1996).

Reinforcements

Reinforcements are the effects of behavior that decrease or increase the chances of the reoccurrence of a particular behavior depending on whether they are perceived by an individual as positive or negative. A couple of the women mentioned that their increased age had contributed to their awareness of the importance of a healthy diet and the need to make dietary improvements. Other researchers have found increased age to be associated with healthier dietary habits or increased awareness of diet-health relationship (Hagdrup et al. 1998, Hunt et al. 1997, Krebs-Smith et al. 1997, Lennernas et al. 1997, Glanz et al. 1998).

A few women indicated that it was important for their children to consume vegetables. Some women in our study were driven to prepare vegetables based on the benefit to their children's health thereby reinforcing the behavior to prepare vegetables. Prior research has not indicated this as a factor affecting the dietary intakes of women.

Personal preferences, which include taste and cravings, arose as strong themes influencing general food choices and the intakes of fruits, vegetables, and grains. For example, if a person liked the taste it was a positive reinforcement for intake, and if a person disliked the taste it was a negative reinforcement discouraging further intake. Published research has found the perception of taste to be significantly related to fruit and vegetable intake (Betts et al. 1997, Keim et al. 1997, Krebs-Smith et al. 1995, Glanz et al. 1998). Heimendinger and Van Duyn (1995) found taste to be a perceived barrier to the consumption of cruciferous vegetables such as broccoli. Others studies have found taste to be an important factor influencing general food choices as well (Betts et al. 1995, LSRO 1995). If a food item is well liked or craved by an individual, it is more likely to

provide gratification and therefore be eaten. Likewise, foods that are not liked, whether healthy or not, are more likely to be avoided. This appeared to be a dominating factor for some women who even indicated that many food selections were based solely on food likes and cravings. In fact, Cotugna et al. (1992) reported that subjects cited liking the taste of current food choices as a primary reason for not making dietary changes.

In our focus groups, in response to how moods affected their diet, the women overwhelmingly chose unhealthy food items during times of stress. Specific examples of stressful situations included times of anger, depression and their menstrual cycle. Unhealthy food items included high fat food items such as chocolate and potato chips. These foods may be comforting for them and provide positive reinforcement. Hetzler and Frary (1996) reported that the response of eating when feeling blue was significantly related to fat intake. Drewnowski (1997) made reference to research that has indicated that sensory pleasure response to foods may be mediated by chemicals in the brain. It may be beneficial to help women recognize these cravings related to stressful times and encourage them not to try to make new dietary changes during stressful times of the day or month.

Expectations

Each individual holds *expectations* or beliefs about likely outcomes of a particular behavior. The value that an individual places on the learned expectations or reinforcements influences their behavior (Baranowski et al. 1997). For example, a person may expect a particular food item to provide a health benefit, value that benefit and therefore choose to eat that particular item.

Health benefits of eating both fruit and vegetables were a positive factor that led to their incorporation into the diets of some women. Previous research has identified health benefits to be an important factor that influences food choices (Betts et al. 1995, Lennernas et al. 1997, LSRO 1995). However, the survey conducted by Betts and her colleagues (1997) failed to find healthy perceptions to be related to the frequency of intake. Keim et al. (1997) found actual selection of fruits and vegetables to be influenced less by healthy and fattening perceptions than other factors.

The health benefits of both fruit and vegetables were mentioned as reasons to incorporate them into the diet; however, because most of the benefits to eating healthy are long-term, healthy eating did not always encourage behavior. Comments included “if I knew it would work for me, it would be worth the time and effort,” and “I’ll be healthy for a week and it won’t do anything for me.” This attitude prevents consistent intake of fruits and vegetables in the diet. However, Glanz et al. (1998) found nutrition to be one of four factors that predicted fruit and vegetable intake.

Health benefits in general appeared to be a weak factor for consistent intake for the participants in our focus groups based on comments made by the women. For those trying to eat vegetables due to the health benefits, one vegetable a day may be enough for many of the women to feel that they have tried hard enough to include vegetables in the diet. Even though they may be concerned by health risk associated with a poor diet, other factors seem to be more influential in day-to-day food choices. However, Kristal et al. (1995) found predisposing factors (belief in a diet-disease relationship, perceived benefits of a healthy diet, and the motivation to attempt a more healthful diet) to be stronger

predictors of behavior than enabling factors (perceived barriers, norms, and social support).

Health concerns were also mentioned as a motivator for making dietary changes. Zunft et al. (1997) reported that 67% of a representative sample of Europeans indicated the desire to stay healthy and prevent disease as benefits to eating healthy. Reported beliefs about healthy eating by the Europeans were not necessarily reflected in food choices. The researchers suggest that "healthy eating and its potential benefits may be considered as a theoretical issue without personal relevance as long as the individual has no nutrition-related disease" (p. S45).

In our study, persons who experienced diet-related diseases themselves or had family members with diseases seemed to recognize the diet-health relationships and to place more value on the outcome of eating healthy because of personal experience with disease. They appeared to be more likely to be motivated to make changes and to maintain desired dietary improvements than individuals who had not had personal experience with diet related illness. Devine et al. (1998) found that health status of participants influenced their food choices. Dittus et al. (1995) found perceptions of a susceptibility to cancer were positively correlated with healthy nutrition behavior; this indicates that a fear of disease may encourage intake of healthier foods.

Although health concern was a major reason for making dietary improvements, dissatisfaction with weight was most frequently indicated as the primary motivation for making changes. A major theme among the women was a preoccupation with weight issues even though the women were screened to eliminate women on weight loss diets. Much of the discussion on making healthy dietary changes revolved around weight

issues; therefore, when the women discussed health benefits they were often concerned with immediate weight issues. Supporting this theme, results from the demographic information sheet revealed that two thirds of the subjects claimed they were unhappy with their weight. Nutrition education should include the weight maintaining benefits of fruits, vegetables and grains and the low fat content of each group. The inclusion of this potential benefit might help motivate young women to begin to make recommended changes in the diet. In over half of the focus groups conducted by Betts et al. (1995), weight control was mentioned as a factor influencing their food intake. Glanz et al. (1998) found weight concerns was one of four factors that predicted fruit and vegetable consumption. Zunft et al. (1997) conducted a survey and reported that 53% of Europeans indicated weight control as a benefit to eating healthy.

It will be challenging to increase the consumption of grains. Some women felt that grains were fattening and would cause them to gain weight. Cypel and Prather (1993) surveyed college students and found that food items higher in starch were viewed as relatively bad for you, higher in calories, more processed, and not nutritious. However, in the 1994 DHKS most respondents disagreed with the statement that “starchy foods make people fat” (Delucia 1996).

In addition to the concern for weight gain, the individuals in our study perceived their diets to already be adequate in grains, which may further limit grain consumption. While these women perceived their diets to be adequate in grains, research indicates that many individuals do not know the correct number of servings to consume from grains. Data from the 1994 DHKS revealed that only 5% of respondents knew the correct number of daily grain servings (Delucia 1996). Morton et al. (1997) found that only 2%

of low-income and 9% of high-income individuals knew the correct number of servings of bread, cereal and pasta. The results of the 1994-95 CSFII were analyzed to determine the average servings individuals consumed from grains (FSRG/BHNRC 1997).

American women ate on average 5 1/2 servings of grains, and based on their caloric intake 70% failed to meet recommendations for grains.

When questioned about increasing cereal intake, most individuals in our focus groups stated they liked cereal and would even consider increasing cereal in their diets especially as a snack. Replacing foods low in folate with those higher in folate should be emphasized as opposed to only addition of high folate foods. For example, suggesting that an individual take a bag of cereal to work for snacking instead of buying chips from the vending machine might be a more effective way to increase folic acid intake compared to simply suggesting women to eat more cereal.

Kristal et al. (1990) defined four dimensions (substitution, modification, replacement, and exclusion) of dietary behaviors related to selecting lower-fat diets. Replacement and exclusion were the most significantly correlated with percentage of calories from fat. Three of these terms could be applied to improving folate intakes. Substitution is maintaining similar dietary consumption but modifying it to incorporate the desired change. For example, by substituting skim milk for whole milk the diet is lowered in fat. When applied to increasing folate, a person could substitute orange juice for apple juice. Modification is altering high-fat foods to decrease the fat intake, for example, removing fat from meat. Cooking vegetables less or eating them raw could increase intake of folate. Replacement describes the replacement of high-fat foods with low-fat foods. Replacing potato chips with fortified cereal is an example of the

application of this term to increasing folate. Exclusion is the elimination of a food high in fat to decrease fat in the diet. This term is difficult to apply when attempting to add more nutrients to the diet such as the vitamin folate.

Observational Learning

Relating to *observational learning*, the women were probed for past childhood influences on their food choices. The views were divided on the influences their caregivers might have made regarding food. While some women felt they chose and prepared many of the same types of foods as their mothers, others indicated choosing and preparing foods differently from their mothers. Some food habits from childhood appeared to carry over into adulthood. Devine et al. (1998) found early childhood food exposure influenced food choices. Krebs-Smith et al. (1995) found that participants who indicated a habit of eating fruits and vegetables since childhood had higher intakes of fruits and vegetables. Other studies have found the perception of habit (which may or may not be a habit developed from childhood) of eating certain foods to be related to intake (Betts et al. 1997, Keim et al. 1997). A number of women in our study commonly mentioned avoiding foods they were forced to eat as children. This may be an important issue to consider in forcing children to eat fruits and vegetables since forcing children to eat certain foods has the potential to lead to avoidance.

The women made reference to a traditional role of grains and vegetables as part of a meal. Vegetables were viewed as part of the meal with the evening meal the most common time for consumption. This perception of vegetables seemed to be formed from past family food traditions and continued on especially for those women with children.

Perhaps the traditional role of a vegetable as part of the meal contributes to the feeling that vegetables are easier to consume than fruit, which was not perceived as part of the meal. Food customs shape food patterns and establish traditional staples of the diet. Jerome (1975) studied food patterns of southern born African Americans and identified specific meat, grain and vegetables as core items. In another study conducted by Jerome (1976), he studied the diet changes of southern blacks who migrated to a northern metropolitan area. Jerome found that the industrialized change from the production to purchase of food led to a high calorie and varied diet with the retention of many traditional food items. The wide variety of available food of industrialized areas influenced change in food habits over time by giving individuals more options.

Behavior Capability

The *behavior capability* construct identifies the knowledge and skill to carry out a particular action. While some women had heard of folate, we found a generally uncertainty about its affect on neural tube defects and the benefit to heart disease. Very few women in our study could name foods that were good sources of folate or folic acid. Other research has found this lack of knowledge to be typical of many women (Kloeblen 1999, Perez-Escamilla et al. 1999, CDC 1999). Although nutrition knowledge alone is not a predictive indicator of positive dietary behavior, knowledge is one of the important factors leading to appropriate dietary behavior (Nestle et al. 1998). Data from the 1989-91 CSFII/DHKS indicated that those who were aware of diet and health relationships were more likely to consume a diet following recommendations (LSRO 1995).

With regard to how nutrition professionals can make information more effective, women suggested TV commercials. To influence their intake, material needs to be specific with information on what changes to make, why they should make those changes, and how to incorporate the changes into their busy lifestyle. Reed et al. (1998) found the media outlets, including TV, to be a source of nutrition information for Vietnamese mothers now living in the U.S. Similar to suggestions by the women in our study, the Vietnamese women indicated the importance of nutrition information to be clear and to the point. The Vietnamese subjects also stated that recipes should be “easy, fast, cheap, delicious and nutritious” (Reed et al. 1998, p. 159).

Self-efficacy

Self-efficacy is a construct of the SCT that states a person who does not believe in their ability to overcome difficulties of performing goals will probably stop trying (AbuSabha and Achterberg 1997). If a person feels confident about their knowledge and their ability to make appropriate changes, they will be more likely to make and maintain any necessary changes. Many women seemed to lack the confidence in overcoming barriers. The women in our focus groups felt it took great effort to make healthful dietary changes, and a lack of continued persistence led to failures at attempts to improve their diets. The effort that was associated with increasing fruits and vegetables may lead to feelings of not being able to accomplish the changes. One woman stated, “I would love to change my diet, but there are so many other factors that keep it from happening.”

The feeling of confidence towards eating fruits and vegetables was associated with higher intakes of fruit and vegetables in a study conducted by Brug et al. (1995).

Willpower and giving up liked food items were labeled as a self control issues that created barriers to healthy eating for subjects in Europe (Lappalainen et al. 1997). Since small changes in our study have helped women make desired changes, perhaps suggesting small changes rather than a complete diet makeover will help women to feel that changes are less difficult and inconvenient and likewise improve their confidence in making dietary improvements.

Conclusions

Many similarities were found among the groups and in individual perceptions, but the varying opinions of influences on behavior indicate a need to assess and evaluate the target population that nutrition professionals are attempting to influence. Discovering individual perceptions of factors that influence dietary behavior is important for understanding food choices. Identifying specific barriers to incorporating fruits, vegetables, and grains and addressing those specific factors will help in the development of effective interventions. The incorporation of strategies to overcome barriers is more likely to influence the development of positive outcomes. Other research has found the perceptions of barriers to be associated with lower intakes of healthier food choices. Hagdrup et al. (1998) found 82% of respondents indicated barriers to eating healthy food and those individuals who indicated any barriers had significantly lower fruit and vegetable intakes. Dittus et al. (1995) reported barriers to be more strongly related to nutrition behavior than perceived benefits.

Busy lifestyles were a barrier to making changes and individuals often chose items that were perceived as convenient, which were faster and easier to prepare. For

some women, fruit and vegetables and overall eating healthy were not perceived as convenient. It appears that changes in lifestyles, such as women working outside the home, have led to new and powerful influences on women's food habits when it comes to preparation and consumption. The fast paced lifestyles of today's working women are not conducive to nutritious food choices. Information should provide fast and practical means for incorporating fruits and vegetables into busy lifestyles. Perhaps programs implemented at the work place of women could be instrumental in effecting change.

Although health benefits were mentioned in all groups as important, since the damage to the body cannot be seen directly, it appears many women put their efforts and attention into the day to day concerns of their life that affect them more directly. As many women mentioned, eating fruit and vegetables to avoid negative health effects or to gain health benefits is difficult advice to follow. Although knowledge may be the first step in introducing health information, women need more help to make changes in their diets. The suggestions for dietary improvements need to be realistic with their lifestyles in mind. They need more information than just what they should do and why they should do it. Long-term benefits of a healthy diet are not enough to sustain changes. The women need guidance for incorporating the recommended changes. They need to know how to change because so many other factors of their lives inhibit long-term commitment to recommendations.

Women feel a sense of responsibility for family members especially their children. In promoting increased fruit, vegetable and grain consumption it might be advantageous to focus on family health. As the primary caregiver in many cases, the women might be motivated to make changes in their own diet if the family's health is a

focus of the nutrition information. Folate rich foods that the entire family will eat should be emphasized.

Also, the women perceived that nutrition information is conflicting, so they feel overwhelmed and confused. In many cases the women ignore recommendations. Although much of the information released is out of the control of individual nutrition educators, nutrition professionals can address some of the erroneous information that may be available on any particular topic being addressed.

Differences between influences on fruit and vegetables choices were observed. It is important to look at perceptions of these independently rather than grouping them together into one category. Brug et al. (1995) found motivations for consuming fruit, cooked vegetables, and salad were varied.

Limitations

There are limitations to this study. First, the subjects were not randomly selected; therefore, the convenience sample limits the generalization of our results to the overall U.S. population. These findings may apply only to women of similar backgrounds. The women in the focus groups were predominately white (93%). The women participating in our focus groups were more highly educated than the average U.S. citizen. Sixty-three percent of the participants graduated from college compared with the U.S. average of 24% (U.S. Bureau of the Census 1998). However, our results corroborate findings from other nutrition studies.

Secondly, the inductive analysis used in this study opens the door for researcher bias. Great effort was made to be honest and accurate when analyzing and reporting the

data. A second researcher coded three of the seven focus group transcripts to increase coding reliability. Third, reported influences do not necessarily correlate with “true” influences on food choice. For example, a person may have indicated price as a factor limiting the intake of fruit, but they may purchase a similar priced snack such as a candy bar; therefore, taste may actually be more of a factor.

Despite limitations, this research provides important insights into individual perceptions of influences on food choices. The focus groups allow the moderator to direct the conversation so that the participants are not constricted or limited by research guided choices. The use of the theoretical framework in designing the semi-structured questions for the focus groups helped to generate perceptions influencing dietary behavior. The use of this theory in evaluating the results made it possible to understand perceptions and offer suggestions for affecting these women based on their perceptions.

Implications

Results from this research indicate the need for nutrition professionals to consider the many personal and environmental factors that can affect food choices of women. Nutrition education materials or programs should not only include the importance of food choices to diet-health relationships but also address barriers to changing the diet. These barriers and other factors vary between different population groups. It is important to assess both the needs and the barriers. The women were aware of their general need to increase fruit and vegetable intake; however, they found it difficult to increase the intake of the two because of perceived barriers.

More research is needed to determine what motivates women to change their diets and more importantly to maintain those changes. For women who are successful, what most influences their commitment? The identification of motivators will help create more effective interventions for promoting and sustaining dietary behavior changes.

BIBLIOGRAPHY

- AbuSabha R, Achterberg C. Review of self-efficacy and locus of control for nutrition- and health-related behavior. *J Am Diet Assoc* 1997;97:1122-1132.
- Alaimo K, McDowell MA, Briefel RR, Bischof AM, Caughman CR, Loria CM, Johnson CL. Dietary intake of vitamins, minerals, and fiber of persons ages 2 months and over in the United States: Third National Health and Nutrition Examination Survey, Phase 1, 1988-91. *Advance Data*, No. 258; 1994.
- Albertson AM, Tobelmann RC, Marquart L. Folate consumption and the role of ready-to-eat cereal for American women aged 15 to 50 years. *Top Clin Nutr* 1997;12:58-68.
- Bandura A. *Social Foundations of Thought and Action: A Social Cognitive Theory*. Englewood Cliffs, NJ: Prentice Hall, 1986.
- Baranowski T, Perry CL, Parcel GS. How individuals, environments, and health behavior interact: Social Cognitive Theory. In: Glanz K, Lewis FM, Rimer BK, ed. *Health Behavior and Health Education Theory Research, and Practice*. San Francisco, CA: Jossey-Bass Publishers, 1997:153-177.
- Bennett JW, Smith HL, Passin H. Food and culture in southern Illinois--a preliminary report. *Am Sociol Rev*. 1942;7:645-660.
- Betts NM, Amos RJ, Georgiou C, Hoerr SL, Ivaturi R, Keim K, Tinsley A, Voichick J. What young adults say about factors affecting their food intake. *Ecol Food Nutr* 1995; 34:59-64.
- Betts NM, Amos RJ, Keim K, Peters P, Stewart B. Ways young adults view food. *J Nutr Educ* 1997; 29:73-79.
- Betts NM, Baranowski T, Hoerr SL. Recommendations for planning and reporting focus group research. *J Nutr Educ* 1996; 28:279-281.
- Brouwer IA, van Dusseldorp M, Thomas CMG, Duran M, Hautvast JGAJ, Eskes TKAB, Steegers-Theunissen RPM. Low-dose folic acid supplementation decreases plasma homocysteine concentrations: a randomized trial. *Am J Clin Nutr* 1999;69:99-104.
- Brug J, Glanz K, Kok G. The relationship between self-efficacy, attitudes, intake compared others, consumption, and stages of change related to fruit and vegetables. *Am J Health Promot* 1997; 12:25-30.
- Brug J, Lechner L, De Vries H. Psychosocial determinants of fruit and vegetable consumption. *Appetite* 1995;25:285-296.

- Butterworth CE, Bendich A. Folic acid and the prevention of birth defects. *Ann Rev Nutr* 1996; 16:73-97.
- Center for Disease Control. Economic burden of spina bifida-- U.S. 1980-1990. *MMWR* 1989;38:264-247.
- Centers for Disease Control. Knowledge and use of folic acid by women of childbearing age—United States, 1995 and 1998. *MMWR* 1999; 48:325-327.
- Centers for Disease Control. Knowledge and use of folic acid by women of childbearing age—United States, 1997. *MMWR* 1997; 46:721-723.
- Centers for Disease Control. Prevalence of spina bifida at birth—United States, 1983-1990: a comparison of two surveillance systems. *MMWR* 1996;45:15-26.
- Centers for Disease Control. Recommendations for the use of folic acid to reduce the number of cases of spina bifida and other neural tube defects. *MMWR* 1992;41:1-7.
- Chamberlain VM. *Creative Home Economics Instruction, 3rd Edition*. Peoria, IL: MacMillian/McGraw-Hill; 1992:18.
- Cotugna N, Subar AF, Heimendinger J, Kahle L. Nutrition and cancer prevention knowledge, beliefs, attitudes, and practices: The 1987 National Health Interview Survey. *J Am Diet Assoc* 1992; 92:963-968.
- Crider AB, Goethals GR, Kavanaugh RD, Solomon PR. *Psychology, 3rd Edition*. Glenview IL: Scott, Foresman & Company; 1989:411.
- Cypel YS, Prather ES. Assessment of the food perceptions of university students. *J Am Diet Assoc* 1993;93:330-332.
- de Graaf C, Van der Gaag M, Kafatos A, Lennernas M, Kearney JM. Stages of dietary change among nationally-representative samples of adults in the European Union. *Eur J Clin Nutr* 1997;51,Suppl 2:S47-S56.
- Delucia BA. Influences on lifestyle patterns on diet [thesis]. Stillwater, OK: Oklahoma State University; 1996.
- Devine CM, Connors M, Bisogni CA, Sobal J. Life-course influences on fruit and vegetable trajectories: qualitative analysis of food choices. *J Nutr Educ* 1998;30:361-370.
- Dittus KL, Hillers VN, Beerman KA. Benefits and barriers to fruit and vegetable intake: relationship between attitudes and consumption. *J Nutr Educ* 1995; 27:120-126.
- Drewnowski A. Taste preferences and food intake. *Ann Rev Nutr* 1997;17:237-253.

Food and Drug Administration. Food standards: amendment of the standards of identity for enriched grain products to require addition of folic acid. *Fed Register* 1996;61:8781-8797.

Food Marketing Institute. *Trends in the United States: Consumer Attitudes and the Supermarket*. Chicago: Food Marketing Institute, 1996.

Food Surveys Research Group, Beltsville Human Nutrition Research Center. *Pyramid Servings Data: Results from USDA's 1994 Continuing Survey of Food Intakes by Individuals*. Riverdale, MD. US Department of Agriculture, 1997.

Gates GE, Holmes TW. Folate intake and supplemental use in women of childbearing age. *Fam Econ Nutr Rev*, in press.

Glanz K, Basil M, Maibach E, Goldberg J, Snyder D. Why Americans eat what they do: taste, nutrition, cost, convenience, and weight control concerns as influences on food consumption. *J Am Diet Assoc* 1998;98:1118-1126.

Glanz K, Rimer BK. *Theory at a Glance: A Guide for Health Promotion Practice*. National Cancer Institute, NIH Publ. No. 97-3896, 1997.

Haber A, Runyon R. *Fundamentals of Psychology*. Philippines: Addison-Wesley Publishing Co.; 1974:577.

Hagdrup NA, Simoes EJ, Brownson RC. Fruit and vegetable consumption in Missouri: knowledge, barriers, and benefits. *Am J Health Behav* 1998; 22:90-100.

Harnack L, Block G, Subar A, Lane S, Brand R. Association of cancer prevention-related nutrition knowledge, beliefs, and attitudes to cancer prevention dietary behavior. *J Am Diet Assoc* 1997; 97:957-965.

Harris JE, Murray L. The relationship between social cognitive model variables and fruit and vegetable consumption among college students. *Am J Health Studies* 1997; 13:133-140.

Heimendinger J, Van Duyn MAS. Dietary behavior change: the challenge of recasting the role of fruit and vegetables in the American diet. *Am J Clin Nutr* 1995; 61, suppl:1387S-1401S.

Henshaw SK. Unintended pregnancy in the United States. *Fam Plan Persp* 1998;30:24-29.

Hertzler AA, Frary RB. Family factors and fat consumption of college students. *J Am Diet Assoc* 1996;96:711-714.

Hunt MK, Stoddard AM, Glanz K, Hebert JR, Probart C, Sorensen G, Thomson S, Hixson ML, Linnan L, Palombo R. Measures of food choice behavior related to intervention messages in work site health promotion. *J Nutr Educ* 1997; 29:3-11.

Ippolito PM, Mathios AD. *Information and Advertising Policy: A Study of Fat and Cholesterol Consumption in the US, 1977-1990*. Washington, DC: Bureau of Economics Staff Report, Federal Trade Commission; August 1996.

✓ Jerome NW. Diet and acculturation: the case of black-American in-migrants. In: Anonymous, ed. *Nutrition Anthropology*. Bedford Hills, NY: Redgrave Publishing, 1980:275-325.

Jerome NW. Flavor preferences and food patterns of selected U.S. and Caribbean blacks. *Food Tech* 1975;29:46-51.

Jerome NW. On determining food patterns of urban dwellers in contemporary United States society. In: Arnott L, ed. *Gastronomy, the Anthropology of Food Habits*. Paris: Mouton Publishers, 1976:91-111.

Kearney M, Gibney MJ, Martinez JA, de Almeida MDV, Friebe D, Zunft HJF, Widhalm K, Kearney JM. Perceived need to alter eating habits among representative samples of adults from all member states of the European Union. *Eur J Clin Nutr* 1997; 51, Suppl 2: S30-S35.

Keim KS, Stewart B, Voichick J. Vegetables and fruit intake and perceptions of selected young adults. *J Nutr Educ* 1997; 29:80-85.

Kirby SD, Baranowski T, Reynolds KD, Taylor G, Binkley D. Children's fruit and vegetable intake: Socioeconomic, adult-child, regional, and urban-rural influences. *J Nutr Educ* 1995;27:261-271.

Kloeblen AS. Folate knowledge, intake from fortified grain products, and periconceptional supplementation patterns of a sample of low-income pregnant women according to the Health Belief Model. *J Am Diet Assoc* 1999; 99:33-38.

Krebs-Smith SM, Cleveland LE, Ballard-Barbash R, Cook DA, Kahle LL. Characterizing food intake patterns of American adults. *Am J Clin Nutr* 1997;65:1264S-1268S.

Krebs-Smith SM, Heimendinger J, Patterson BH, Subar AF, Kessler R, Pivonka E. Psychosocial factors associated with fruit and vegetable consumption. *Am J Health Promot* 1995;10:98-104.

Kristal AR, Patterson RE, Glanz K, Heimendinger J, Hebert JR, Feng Z, Probart C. Psychosocial correlates of healthful diets: baseline results from the Working Well Study. *Prev Med* 1995;24:221-228.

Kristal AR, Shattuck AL, Henry HJ. Patterns of dietary behavior associated with selecting diets low in fat: reliability and validity of a behavioral approach to dietary assessment. *J Am Diet Assoc* 1990;90:214-20.

Krueger RA. *Focus Groups: A Practical Guide for Applied Research, Second Edition*. Thousand Oaks, CA: Sage Publications, 1994.

Lappalainen R, Saba A, Holm L, Mykkanen H, Gibney MJ. Difficulties in trying to eat healthier: descriptive analysis of perceived barriers for healthy eating. *Eur J Clin Nutr* 1997; 51, suppl 2: S36-S40.

Lennernas M, Fjellstrom C, Becker W, Giachetti I, Schmitt A, Remaut de Winter AM, Kearney M. Influences on food choice perceived to be important by nationally-representative samples of adults in the European Union. *Eur J Clin Nutr* 1997; 51, suppl 2: S8-S15.

Life Sciences Research Office, Federation of American Societies of Experimental Biology. *Third Report on Nutrition Monitoring in the United States*. Washington, DC. US Government Printing Office, 1995.

Malinow MR, Duell PB, Hess DL, Anderson PH, Kruger WD, Phillipson BE, Gluckman RA, Block PC, Upson BM. Reduction of plasma homocysteine levels by breakfast cereal fortified with folic acid in patients with coronary heart disease. *N Engl J Med* 1998; 338:1009-1015.

McNulty H. Folate requirements for health in women. *Proc Nutr Soc* 1997;56:291-303.

MRC Vitamin Study Research Group. Prevention of neural tube defects: Results of the Medical Research Council Vitamin Study. *Lancet* 1991;338:131-137.

Morton JF, Guthrie JF. Diet-related knowledge, attitude and practices of low-income individuals with children on the household. *Fam Econ Nutr Rev* 1997;10:2-15.

National Academy of Sciences, Food and Nutrition Board. Folate. In: *Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline*. Washington, DC: National Academy Press 1998:8.1-8.68.

Nestle M, Wing R, Birch L, DiSogra L, Arbor A, Middleton S, Sigman-Grant M, Sobal J, Winston M, Economos C. Behavioral and social influences on food choice. *Nutr Rev* 1998; 56:S50-S74.

Parraga IM. Determinants of food consumption. *J Am Diet Assoc* 1990;90:661-663.

Perez-Escamilla R, Himmelgreen D, Segura-Millan S, Gonzales A, Mendez I, Haldeman L. Knowledge of folic acid and neural tube defects among inner-city residents: Have they heard about it? *J Am Diet Assoc* 1999; 99:80-83.

- Povey R, Conner M, Sparks P, James R, Shepherd R. Interpretations of healthy and unhealthy eating, and implications for dietary change. *Health Educ Res* 1998; 13:171-183.
- Reed DB, Meeks PM, Nguyen L, Cross EW, Garrison MEB. Assessment of nutrition education needs related to increasing dietary calcium intake in low-income Vietnamese mothers using focus group discussion. *J Nutr Educ* 1998;30:155-163.
- Scott JM, Weir DG, Kirke PN. Folate and neural tube defects. In: Bailey LB, ed. *Folate in Health and Disease*. New York; Marcel Dekker Inc. 1995;329-360.
- Shepherd SK, Achterberg CL. Qualitative research methodology: data collection, analysis, interpretation, and verification. In: Monsen ER. ed. *Research: Successful Approaches*. Chicago: ADA, 1992:82-99.
- Subar AT, Block G. Use of vitamin and mineral supplements: Demographics and amounts of nutrients consumed; The 1987 Health Interview Survey. *Am J Epid* 1990;132:1091-1101.
- Subar AF, Block G, James LD. Folate intake and food sources in the US population. *Am J Clin Nutr* 1989;50:508-516.
- Urban N, White E, Anderson GL, Curry S, Kristal AR. Correlates of maintenance of a low-fat diet among women in the Women's Health Trial. *Prev Med* 1992;21:279-291.
- US Bureau of the Census. Educational Attainment in the US: March 1998. Available at: <http://www.census.gov/Press-Release/cb98-221.html>. Accessed May, 20 1999.
- Zunft HJF, Friebe D, Seppelt B, de Graaf C, Margetts B, Schmitt A, Gibney MJ. Perceived benefits of healthy eating among a nationally-representative sample of adults in the European Union. *Eur J Clin Nutr* 1997; 51, suppl 2:S41-S46.

APPENDIX A

INSTITUTIONAL REVIEW BOARD

APPENDIX A

INSTITUTIONAL REVIEW BOARD FORM

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD

DATE: 01-20-98

IRB #: HE-98-040A

Proposal Title: ENHANCING PREVENTION OF NEURAL TUBE DEFECTS IN
OKLAHOMA

Principal Investigator(s): Gail Gates

Reviewed and Processed as: Continuation

Approval Status Recommended by Reviewer(s): Approved

Signature:

Date: December 7, 1998



Carol Olson, Director of University Research Compliance

Approvals are valid for one calendar year, after which time a request for continuation must be submitted. Any modification to the research project approved by the IRB must be submitted for approval. Approved projects are subject to monitoring by the IRB. Expedited and exempt projects may be reviewed by the full Institutional Review Board.

APPENDIX B

FOCUS GROUP SCREENING FORM

FOCUS GROUP SCREENING FORM

Name _____

Phone # _____

- | | | |
|---|-----|----|
| 1. Are you a woman between the ages of 18 and 44?..... | Yes | No |
| 2. Are you pregnant?..... | Yes | No |
| 3. Do you have a chronic disease that affects dietary intake?.... | Yes | No |
| 4. Are you a nutrition major?..... Yes | No | |
| 5. Are you dieting?..... | Yes | No |
| 6. Are you a student?..... | Yes | No |

APPENDIX C

RECRUITMENT FORM



How Women Choose Food

Female Participants Needed For Oklahoma State University Research Project

Would you like the opportunity to express your opinion on what influences your food choices?

For your participation, you will receive \$25.00 and a diet analysis.

If you are a woman between the ages of 18 and 44, you can participate in research on dietary behavior that is being conducted at Oklahoma State University. To participate, you must neither be pregnant nor have a chronic disease that affects dietary intake. Your opinion is valuable, and we need your participation in focus group interviews. The purpose of the study is to find out what influences the food choices of women and how women wish to receive information about healthy eating. The group interview is simple and easy taking about 1-½ hours to complete. Childcare will be provided upon request. Interviews are being scheduled during the next few weeks.

Volunteers will receive \$10.00 for finishing the group interview and completing a food frequency questionnaire. Refreshments will be served after the interview. You will receive an additional \$15.00 when you finish the food record. You will also receive nutrient analysis feedback from your food record.

The group interview will be videotaped. The tape of the interview will be transcribed to allow researchers to analyze the results of the interviews. The information will remain confidential. This study has been approved by the Institutional Review Board for Protection of Human Subjects at Oklahoma State University.

Thank you for interest. For more information or to volunteer for the project, please contact one of the following individuals.

Gail E. Gates, Ph.D., RD
Principal Investigator
Department of Nutritional Sciences
Oklahoma State University
(405) 744-5032

Christy Russell
Research Assistant
(405) 624-6027

APPENDIX D

NEWSPAPER RECRUITMENT ADVERTISEMENT

How Women Choose Food

Women 18-44 needed for
OSU nutrition study.
Conducting interviews
on food choices. You
will receive \$25.00
and a diet analysis.

Contact

Gail Gates, PhD, RD
Nutritional Sciences
Department, OSU
(405) 744-5032.

APPENDIX E

FOCUS GROUP QUESTIONS

FOCUS GROUP QUESTIONS

1. Think back to the last time you ate a meal that you enjoyed. What did you eat?
2. How did you decide what to eat?

What influences your selection of these foods? (ie easy, fast, taste, habit)

How do others influence your selection of these foods?

How does what you ate as a child affect your food consumption?

How does your mood affect what you eat?

What foods do you eat in those moods?

3. What are some fruits that you eat regularly?
4. Why do you eat fruits?

(What does the word healthy/nutritious mean to you?)

How important is it to you to make sure that you include fruit in your diet?

5. What prevents you from adding more fruit to your diet?
6. What are some vegetables that you eat regularly?
7. Why do you eat vegetables?

(What does the word healthy/nutritious mean to you?)

How important is it to you to make sure that you include vegetables in your diet?

8. What prevents you from adding more vegetables to your diet?
9. What are some grains that you eat regularly?
10. Why do you eat grains?

How important is it for you to make sure that you include grains in your diet?

Would you be willing to eat more cereal? When?

11. What prevents you from adding more grains to your diet?
12. If you were planning to make changes, what would motivate you to make changes in your diet?
13. How have you tried in the past to eat healthier?

Describe the success of those changes.

How were you able to make those changes?

If you were not successful, why do you think you were not?

14. How do you reward yourself when you accomplish goals for eating healthier?
15. What are your suggestions for educating women about the importance of eating fruits, vegetables and grains?

What type of information should be included?

What would get you to follow the advice?

16. Why is folate important to women?
17. What are some food sources that contain folate?
18. Which of these foods would you add to your diet?

How would you incorporate them into your diet?

Which of these foods do you see as more affordable? convenient?

19. If you knew that consuming adequate folate may help reduce the risks of birth defects and heart disease, what would this mean to you?
20. How do you feel about taking vitamin supplements?
21. Would you be more likely to increase folate in your diet with folate containing foods or supplements?
Which is easier for you and why?

APPENDIX F

CONSENT TO PARTICIPATE IN RESEARCH

CONSENT TO PARTICIPATE IN RESEARCH

Factors Influencing Folate Intake in Women

I, _____, voluntarily agree to participate in the above titled research. The Oklahoma Center for the Advancement of Science and Technology and the College of Human Environmental Sciences at Oklahoma State University sponsor this research.

I understand that:

- (1) the purpose of the study is to find out what influences the food intake of women.
- (2) I will participate in a focus group interview about influences on my food preferences and choices.
 - (a) The interview will take about 1 to 1 1/2 hours.
 - (b) I will allow the researcher to videotape my interview.
 - (c) The tape of the interview may be transcribed.
- (3) I will complete a food frequency questionnaire at the beginning of the study that will ask me to recall my typical food choices;
- (4) I will receive \$10.00 for finishing the focus group interview and completing the food frequency questionnaire.
- (5) I will record my daily food intake for four days
- (6) I will receive \$15.00 for completing the four day food record.
- (7) All records are confidential. My name will not be used in any reports or data records at the end of the study. All information obtained about me as an individual will be considered privileged and held in confidence.
 - (a) Videotapes of the interviews will be viewed by the project director or her authorized representatives. Tapes will be filed in the project director's office until completion of the study when they will be destroyed.
- (8) I volunteer to take part in this study.
 - (a) I have the right to withdraw from this study at any time by contacting the researchers.
 - (b) I may stop participating in the study at any time without penalty or loss of benefits that I am otherwise entitled to receive.
- (9) this research is beneficial in that it provides information about the effects of nutrition education on food habits of women; and
 - (a) the information gained from this study may provide information useful in helping women choose nutritionally adequate diets;
- (10) if I need more facts about the study I may contact Dr. Gail Gates at (405) 744-5032. I may also contact Gay Clarkson at the office of University Research Services, 305 Whitehurst, Oklahoma State University, Stillwater, OK 74078 at (405) 744-5700.

I have read and fully understand the consent form. I sign freely and voluntarily. A copy has been given to me.

Date _____ Time _____

Subject Name (please print) _____

Signed _____

Permanent Address _____

I certify that I have personally explained all parts of this form to the subject before requesting the subject to sign it.

Signed _____
(project director or her authorized representative)

Printed name _____
(project director or her authorized representative)

APPENDIX G

DEMOGRAPHIC INFORMATION SHEET

DEMOGRAPHIC INFORMATION SHEET

1. During the past year, have you taken any vitamin or mineral supplements? (Circle number)

- 1 NO
- 2 YES, fairly regularly
- 3 YES, but not regularly

2. If yes, circle the supplement that best describes what you take. (Circle number)

- 1 Multivitamin
- 2 Vitamin C
- 3 Vitamin E
- 4 Folic Acid
- 5 Other, specify _____

3. ____ft____in Current height in feet and inches

4. ____ Current weight in pounds

5. ____ Age in years

6. How satisfied are you with your current weight? (Circle number)

- 1 VERY SATISFIED 2 SATISFIED 3 UNSATISFIED 4 VERY UNSATISFIED

7. Which of the following describes your current diet? (Circle number)

- 1 Normal/General
- 2 Weight reduction
- 3 Weight gaining
- 4 Low Fat/Low Cholesterol
- 5 Low Salt/Low Sodium
- 6 High Fiber
- 7 Diabetic
- 8 Vegetarian
- 9 Other, specify _____

8. List the people who live in your household.

<u>Relationship</u>	<u>Age</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

9. Which of the following describes your current student status? (Circle number)

- 1 Full-time student
- 2 Part-time student
- 3 Not a student

10. What is the highest level of education that you have completed? (Circle number)

- 1 Elementary School (grades 1-6)
- 2 Some High School
- 3 High School Graduate/GED
- 4 Some Technical School/Some College
- 5 Technical School Degree
- 6 College Graduate
- 7 Graduate School

11. Which of the following describes your current work status? (Circle number)

- 1 Employed full-time
- 2 Employed part-time
- 3 Homemaker
- 4 Unemployed

12. What is your race? (Circle number)

- 1 White
- 2 Black
- 3 Asian/Pacific Islander
- 4 American Indian/Alaska Native
- 5 Other

13. Are you of Hispanic origin? (Circle number)

- 1 YES
- 2 NO

14. Which represents your income from all sources over the past year? (Circle number)

- | | |
|------------------------|-----------------------|
| 1 Under \$10,000 | 5 \$25,000 - \$29,999 |
| 2 \$10,000 - \$14,999 | 6 \$30,000 - \$34,999 |
| 3 \$15,000 - \$19,999 | 7 \$35,000 - \$49,999 |
| 4 \$20,000 - \$ 24,999 | 8 \$50,000 and over |

15. Which of the categories comes closest to describing the paid work that you do?

- 1 Professional or technical
- 2 Manager, officer or proprietor
- 3 Clerical or sales worker
- 4 Service worker or other similar job
- 5 Other, specify_____

APPENDIX H

ANALYSIS FORM

Focus Group #	
Date of Focus Group	
Number of Participants	

What prevents you from eating more fruit?

Key Points & Themes	Quotes

SECRET

APPENDIX I

CODE WORD DESCRIPTIONS

CODE WORDS

DEFINITIONS

FOOD CHOICE INFLUENCES:

Appearance	– how the food looks
Color	– visual perception that enables one to differentiate otherwise identical objects
Texture	– physical structure and feel of food
Temperature	– warmth or coolness of food
Spoilage rate	– speed of unfitness for consumption
Versatile	– changing or fluctuating readily
Personal preference	– choosing one over another
Satisfaction	– fulfillment of a need or want
Taste	– to ascertain a flavor by mouth
Craving	– a great desire or longing
Mood	– emotional state
Convenience	– suitable time
Ease of preparation	– effort it takes to get something ready for some purpose
Time of preparation	– time it takes to get something ready for some purpose
Time	– includes comments about schedules and times influence on eating
Messiness	– untidy
Season	– a period associated with some phase or activity of agriculture related to availability of food
Quality	– degree of excellence
Availability	– accessible or attainable
Geographical Region	– pertaining to a particular geographical area's
Weather	– pertaining to temperature and weather effects on food choices

Cohabitation Effect	– effect of people living in the same household
Husband's preferences	– husband's wants/preferences influence intake
Children's preferences	– children's wants/preferences influence intake
Living alone	– included comments about living alone affecting food choices
Other people	– effect of other people not living in the home
Friends	
Coworkers	
Mother	
Grandmother	
Responsibility to children	– moral, legal, or mental accountability
Role model	– set example for children
Degree of hunger	– a craving or urgent need for food or a specific nutrient
Filling/Provides satiety	– provides state of being full
Not filling	– not providing a feeling of fullness
Frequency of consumption	– the number of times something is eaten
Variety	– having different forms or types
Price	– the amount or equivalent paid or charged for something
Special occasions	– unordinary events such as a holiday or party
Familiarity with service	– frequently experienced the work performed by one who serves
Nutritional quality	– nutrient content of a food

Health benefit	– includes comments about the advantages of certain foods to the body
To feel better about self	– emotional positive feeling provided by particular behavior
Weight control	– includes comments about influences of weight gain or loss
Childhood influence Mother	– influence during state or being of a child – includes comments relating to mother's cooking or food habits
Tradition part of meal	– inherited pattern of thought or action – commonly part of a meal
Habit	– a settled tendency or usual manner of behavior
Work Exposure	– the condition of being subjected to an action or influence at place of employment
Advertisements	– announcement in some public medium
Provide energy (To feel energetic)	– to supply the capacity of feeling active
Place of storage	– physical environment for safekeeping of goods
Cost effective	– economical in terms of tangible benefits produced by money spent
Effort	– an exertion of physical or mental power
Feeling fat	– a feeling of fatness
Personal dietary restrictions	– includes comments about personal dietary limitations such as vegetarianism
Limit Consumption CHO content GI effects	– includes comments where food is limited due to food characteristics – carbohydrate content associated with weight gain – includes comments about undesirable gastrointestinal effects of food

Feeling of adequacy – feeling of eating a sufficient amount

INFLUENCE OF MOOD:

Tired – weary, fatigued

Reward (for tough week) – something that is given in return for good done, some service or attainment

Bad mood – an unhappy state of mind or predominant emotion

Good mood – a happy state of mind or predominant emotion

Anxiety – distress or uneasiness of mind caused by fear, danger or misfortune; tension

Menstrual cycle – monthly reproductive cycle

Stress – a physical, chemical, emotional factor that can cause bodily or mental tension

Boredom – the state of being devoid of interest

Sedentary (TV) – doing or requiring much sitting

Feeling fat – the feeling of fatness

Comfort food cravings – strong desire for food that provides a positive feeling when consumed

MOTIVATION FOR CHANGE:

Health problems – problems with the general condition of the body

Family – a person in family had/has health problems that affected intake of participant

Self – personal health problems affected intake

Health benefits – advantage of certain foods to the body

Health Concerns Related to age	– fear of disease or health concerns – increased age affecting fears of health concerns
Weight control	– includes comments about influences of weight gain or loss
Pregnancy	– includes comments about the effects of food intake on unborn baby
To feel more energetic	– to supply the capacity of acting or being active

ATTEMPTS TO EAT HEALTHIER:

Cutting down	– get rid of in some degree
Substitution	– replacing one thing for another
Adding more	– adding something to the diet
Limit fast food intake	– eating less at fast food restaurants
Vegetarianism	– dietary restriction of meat
Starving	– not eating
Change preparation methods	– change method of cooking
Lifestyle changes	– making other changes along with dietary improvements in lifestyle
Dieting	– limitations on food intake to promote weight loss

FACTORS RELATING TO SUCCESS:

Family influence	– social support for changes
Expense	– cost of something
Motivation (to lose weight)	– the process of being motivated
Lifetime commitment	– making a commitment to change diet
Long-term goals	– setting long-term goals
Self-monitoring	– includes statements about monitoring intake by keeping a written record
Meal Planning	– developing plan for meals in advance
Small changes	– includes comments about small steps to improve the diet
Label reading	– includes comments about being more aware of nutrition information on food labels

Overcoming barriers	– includes the mention of overcoming specific perceived barriers to eating healthier
Weather	– includes comments about the weather's effect on intake
Make effort	
Feeling more energetic	
Feel better about self	
Avoid buying	– not purchasing foods that the person is avoiding
Substitution	
Exercise	– includes comments about the positive effect of physical activity on making changes
FACTORS RELATING TO FAILURES:	
Short term	– covers statements relating to making changes only for a short period
Convenience	
Availability	
Difficulty breaking habits	– includes comments about habits making it difficult to change the diet
Lack of will power	– lack of inner strength to make changes
Lack of persistence	– lack of ability to continue the effort to maintain changes
Too tired	– exhaustion
Busy lifestyle	– includes comments about perception of busy lifestyle or schedule affecting attempts at changes
Cravings	– a great desire or longing
Discipline	– orderly or prescribed conduct or pattern of behavior
Preparation time	– time it takes to get something ready for some purpose
Money	– expense associated with changing diet
Expectant outcome	– no visible results
Children's needs	– child's needs affecting desired changes
Self Efficacy	– not believing in their ability to make changes
Lack of desire to change	– not wanting to make changes

REWARDS:

Monetary rewards	– includes the purchase of items such as clothing for self
Food	– includes eating of any item as a reward for making changes
Massage	– treating the body by rubbing
Verbal rewards	– verbal statements of others
Feeling good	– the way the person felt after eating better was a reward

SUGGESTIONS:

Nothing
Focus on most immediate benefits
Advertising
Focus on responsibility to others
Means of weight control
Info already available
Free and accessible
Scare tactics
Specific (health) info
Targeting while a person is young through women with children
Provide food preparation info
 Easy recipes
Advice appropriate for busy lifestyle
Realistic
Focus on the positive
Needs to be consistent
Make easily accessible and free
Coupons for F,V
Point out low cost items

FOLIC ACID/FOLATE QUESTIONS:

Birth defects
Spina bifida
Unsure
Pregnancy
Heart

Green leafy vegetables
OJ

Cereals (Kellogg's)
Strawberries
Spinach
F & V
Green beans
Broccoli
Vitamins

OJ
Beans
Pasta
Cereal
Spinach

Would increase consumption
 Relationship to child bearing
Would have no effect
Need to provide specific info

VITAMIN vs. FOOD QUESTIONS:

Vitamin
Food
Both
Cost
Forget to take
Don't see a benefit
Don't like
Nauseous when take
Uncertainty about what to take
Less work/easier
Currently taking
Depends on diet
Don't want to eat more
Food better source
Overdosing
Family influence

DEFINITIONS FOR HEALTHY:

Follow recommendations
Regulating
Avoiding fat

Same as nutritious
Long life
Beneficial in preventing disease
Feeling good
Benefit to your body
Provides nutrients
Diet
Specific foods
Not getting sick
Following the Food Guide Pyramid
Weight issue
Inconsistent/Conflicting information
Balance
Moderation
Whole foods
Doesn't taste good
Not processed
Nutrient density
Depends on individual
Complete lifestyle choices

DEFINITIONS FOR NUTRITIOUS:

Following guidelines
Time consuming
Not gaining weight
Health
Balance
Food Guide Pyramid
Fruits and vegetables
Effort
Provides Nutrients
Avoiding fat
Same as healthy

VITA

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