

**FEMALE BABY BOOMERS' PERCEPTIONS OF DAIRY FOODS
AND HOW THEIR PERCEPTIONS INFLUENCE
DAIRY FOOD CHOICES**

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(ABSTRACT)

Osteoporosis is a debilitating disease that afflicts an estimated 25 million Americans, especially women. Suboptimal intakes of calcium, phosphorus, and vitamin D contribute to development of osteoporosis. Results from the Third National Health and Nutrition Examination Survey (NHANES III) indicate that adult women do not meet the Recommended Dietary Allowance (RDA) for calcium. Results from other national studies indicate that adult women consume less than the recommended number of servings of dairy foods per day. Focus groups were conducted in rural and urban areas of Virginia to gain insight into middle aged women's perceptions of dairy foods.

Four focus groups were conducted with a total of 39 women. The majority of the women were between the ages of 35 to 50 years; all were non-Hispanic white women. All had a minimum of a high school education, and the majority had some education beyond high school. Discussion questions addressed preferences for dairy foods, advantages and disadvantages of dairy foods, factors that influence dairy food choices, and possibilities for product improvements. Focus group discussions were audio taped and transcribed by the moderator. The moderator identified major and minor themes; women's responses were organized thematically. Results were reported in the following broad theme categories: perceptions of health and nutrition that influenced dairy food choices and factors that influenced dairy food choices.

The predominant negative perception of dairy foods was that dairy foods were high in fat. Women also negatively associated dairy foods with lactose intolerance and kidney stones. The predominant positive perception of dairy foods was that dairy foods were a good source of calcium. Women also believed dairy foods were a good source of vitamins, although they were unsure of specific vitamins found in dairy foods. Participants were aware of osteoporosis, but many were not knowledgeable about risk factors or prevention related to osteoporosis. Many women used calcium supplements or vitamin-mineral supplements to help meet dietary calcium requirements. Results indicate a need for education on the role of dairy foods in osteoporosis prevention.

Women's preferences for dairy foods influenced dairy food choices. Product characteristics, such as sensory attributes, convenience, cost, availability, and packaging, were mentioned as factors that greatly influenced dairy food choices. The majority of women stated that other household members influenced dairy food choices. Women also mentioned that physicians and media sources, such as magazine advertisements and television commercials, influenced their dairy food choices. Nutrition education for this population should continue to promote the view that "all foods can fit" into a healthy eating pattern. Nutrition education should be geared toward the fast paced lifestyle these women lead. Product development should focus on convenience items.

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CHAPTER I

INTRODUCTION

Statement of the Problem

There are increasing numbers of research studies that indicate the benefits of calcium in the reduction of chronic diseases (Miller et al., 1995a). The chronic low intake of calcium has been linked to an increased risk of hypertension, colon cancer, and osteoporosis (Millen et al., 1997). Hypertension (HTN) affects over 62 million Americans, and it plays a major role in the incidence of heart disease and stroke (Williams, 1993). Studies have indicated that the adequate intake of a combination of nutrients found in dairy foods, such as calcium, magnesium, and potassium, is effective in lowering blood pressure (Miller et al., 1995a; National Dairy Council, 1994). Cardiovascular disease is the leading cause of death in the United States (U.S.) (National Center for Health Statistics, 1996). High levels of fat consumption are related to increased levels of blood lipids. Dairy foods are often thought to be high in fat, but in reality the contribution to total dietary fat and cholesterol provided by dairy foods is far less than that provided by meat, poultry, fish, and fats and oils (Miller et al., 1995a). The unique fatty acid composition found in milk and dairy foods has also been found to not increase the level of blood lipids. Nutrients, such as calcium, found in dairy foods may have an effect on lowering blood lipid levels (National Dairy Council, 1994). Colon cancer is the third leading cause of death from cancer in the U.S. (Newmark and Lipkin, 1992). High intakes of fat are associated with the occurrence of colon cancer. However, the intake of dairy foods, including whole milk, has been found to not increase the risk of colorectal adenomas (Centonze et al., 1994; Newmark & Lipkin, 1992). The relationship between the intake of dairy foods and colon cancer may be due to components such as calcium, vitamin D, bacterial cultures, and fatty acids, that are found in dairy foods (Centonze et al., 1994; National Dairy Council, 1994).

Osteoporosis is a debilitating disease characterized by decreased bone mineral density (BMD) and increased fracture risk. Osteoporosis affects over 25 million Americans. Approximately 80% of the people affected are women. The Third National Health and Nutrition Examination Survey (NHANES III) estimates that 6-7 million women over the age of 50 are afflicted with osteoporosis of the hip (Zizza and Gerrior, 1995). Osteoporosis-related health care costs are between 10 and 18 billion dollars annually. Health care costs related to osteoporosis will increase dramatically as the U.S. population over age 65 increases. By the year 2040, health care costs of osteoporosis will be approximately 50 billion annually (Packard and Heaney, 1997; Raisz, 1997). A life-long insufficient intake of calcium, vitamin D, and phosphorus help contribute to the development of the disease (Finn, 1997; Wardlaw, 1993). The panel from the National Institutes of Health 1994 Consensus Conference on Optimal Calcium Intake recommended that the Recommended Dietary Allowance (RDA) for calcium be increased to 1,000 milligrams per day for women 25-50 years of age (National Institutes of Health, 1994). The recently released Dietary Reference Intakes (DRIs) recommend that women 31-50 years of age consume 1,000 milligrams of calcium per day for prevention of osteoporosis (American Dietetic Association, August 1997; National Academy of Sciences, 1997).

According to preliminary data from NHANES III, adult women in the U.S. do not have median and mean calcium intakes that meet the RDA of 800 milligrams per day (Alaimo et al., 1994). It is estimated that the average daily calcium intake for adult women is approximately 574 milligrams per day (Miller et al., 1995b; Murphy et al., 1992). Chapman et al. (1995) found that women with inadequate dietary intakes of calcium thought they were meeting the RDA for calcium. The RDA for calcium can be met if dairy foods are a regular part of the diet, according to the Food and Nutrition Board (1989). Research continues to provide data on the benefits of calcium, and surveys indicate that women are aware of the benefits calcium provides. However, studies indicate that the average daily intake of calcium has not increased significantly in the past 20 years (Miller et al., 1995b).

According to the 1994 Review of Healthy People 2000, only 16% of women between the ages of 25 and 50 are consuming two or more servings of calcium rich foods daily (U.S. Dept of Health and Human Services, 1994). One of the goals of Healthy People 2000 is to increase the number of individuals consuming two or more servings of calcium rich foods to 50% (U.S. Dept. of Health and Human Services, 1992).

The consumption of dairy foods, especially by adult women, has declined during the past few decades, and this is attributed to the perception that dairy foods are high in fat (Finn, 1997). Lower fat options are now available in the market, and as a result the consumption of high fat dairy foods has declined as the consumption of lower fat dairy foods has increased (Krummel and Kris-Etherton, 1996). However, the acceptance of the lower fat dairy foods has been sporadic because nutrient content, price, and sensory properties determine acceptance. Consumers are not yet willing to sacrifice taste for health benefits (Guinard and Marty, 1997). Soft drink consumption, lactose intolerance, and vegetarian diets may also be responsible for decline in the consumption of dairy foods (Janelle and Barr, 1995; Miller et al., 1995b; Putnam and Duerwer, 1995). Important information needed to promote consumption of dairy foods in women 35 to 50 years of age is an understanding of the perceptions this group of women has about dairy foods.

Purpose of Study

This study is part of an ongoing project to understand women's perceptions of dairy foods and to understand what motivates women to choose dairy foods. The long-term objective of the project is to identify ways to improve dairy food consumption of women through nutrition education and product development. Focus groups are being conducted with different generations of educated, non-Hispanic white women residing in Virginia. Focus groups are being used to explore women's perceptions of dairy foods. The results from the focus groups will be used to design a questionnaire to examine the perceptions and beliefs of a larger sample of women toward dairy foods. Results from the studies then will be used to help design nutrition education programs and dairy products that meet the needs of this subpopulation of women.

The first study of this project examined elderly women's, 65 years of age and older, perceptions of dairy foods. The purpose of this study was to explore the perceptions of dairy foods held by educated, non-Hispanic white women, 35 to 50 years of age, who reside in

Virginia. Pertinent research questions were:

1. What are women's attitudes towards dairy foods?
2. What do women perceive as barriers to consumption of dairy foods?
3. Who/what influences women's dairy food choices?
4. What product improvements or new products would women like to see in the market?

CHAPTER II

REVIEW OF RELATED LITERATURE

Background Information on Calcium

In the United States (U.S.) today many adults do not consume adequate amounts of minerals such as calcium, iron, and magnesium and vitamins such as vitamin B₆, vitamin A, vitamin C, and vitamin E. Within all age groups studied, women are more likely to report intakes below two-thirds of the Recommended Dietary Allowances (RDA) for all nutrients except vitamin A (Murphy et al., 1992). The Food and Nutrition Board (1989) defines the RDAs as the amount of nutrients that adequately meet the nutrient needs of most healthy individuals. The RDAs are population-based and set high enough to be appropriate for most healthy individuals (Koplan et al., 1986; Pao and Mickle, 1981). The Food and Nutrition Board has recently undertaken the development of new dietary requirements, called Dietary Reference Intakes (DRI). Scientific evidence for the prevention or delay of onset of chronic disease or developmental abnormalities are the basis of the DRIs. The DRIs will include the following for each nutrient: 1) estimated average requirement and its standard deviations by age and gender; 2) recommended dietary allowance, based on the estimate average and deviation; and 3) maximum intake levels above which risk of toxicity would increase. The committee responsible for the generation of the DRIs has proposed that the age groups be changed. The proposed change for middle age women would divide the current range, 25-50 years of age, into two groups, 19-30 years of age and 31-50 years of age (Anonymous, August 1996; National Academy of Sciences, 1997).

There is presently a conflict as to what the optimal dietary intake for calcium is, and no consensus has been reached to date (Fleming and Heimbach, 1994). The current RDA for calcium, according to the Food and Nutrition Board (1989), is 800 milligrams per day for women over the age of 24. The National Academy of Sciences recommended 1,000 milligrams of calcium per day for women 31-50 years of age. The increase in the recommendation for calcium is in part due to the effect of calcium intake on osteoporosis risk (National Academy of Sciences, 1997). In 1994, the National Institutes of Health (NIH) sponsored a Consensus Conference on Optimal Calcium Intake. The panel reviewed current research and concluded that the RDA for calcium is inadequate to meet the needs for optimal bone health. The panel recommended that the RDA for calcium be increased to 1,000 milligrams per day for women 25-50 years of age (Krummel and Kris-Etherton, 1996; National Institutes of Health, 1994).

Recommendations for a unified public health strategy to improve the calcium intake of all Americans were made at the NIH Consensus Conference on Optimal Calcium Intake. This strategy would focus on the public and private sectors to promote optimal calcium intake. Recommendations were also made for the development of health education materials and programs designed to meet the needs of the diverse population in the U.S. The National Institutes of Health also recommended that manufacturers of food products continue to develop products that are rich in calcium (National Institutes of Health, 1994).

Calcium in the Body

The adult body contains approximately 1,200 grams of calcium. Ninety-nine percent of this calcium is located in the bones. The remaining 1% of body calcium is found in the extracellular fluids, intracellular structures, and cell membranes where it plays an important role in many body functions (Food and Nutrition Board, 1989).

The intake, absorption, and excretion of calcium regulate calcium status in the body. Calcium losses occur daily, so intake must be adequate to cover the losses. High intakes of caffeine, alcohol, sodium, and protein can increase the amount of calcium lost in the urine, and increased urinary calcium losses are associated with deterioration of calcium balance in the body (Beatty and Finn, 1995; Heaney and Recker, 1982). High protein diets, such as the current American diet, may cause an increase in the need for calcium. Some studies indicate that in isolated cases of excess protein intake the resulting calcium loss may contribute to the development of postmenopausal osteoporosis (Finn, 1997; Heaney and Recker, 1982).

Calcium absorption is approximately 30% of intake, but it can range from as little as 10% to as high as 70% (Miller et al., 1995a). At low to moderate calcium intake, the majority of calcium is absorbed by active transport which is mediated by the active metabolite of vitamin D. Vitamin D is one of the most important regulators of calcium in the body (Ziegler and Filer, 1996). The active metabolite, 1,25-dihydroxyvitamin-D [1,25-(OH)₂D], stimulates the absorption of calcium in the small intestine and colon. The absorption of calcium is less than 10% in the absence of 1,25-(OH)₂D, and it is thought that the age-related decrease in calcium absorption may be due to decreased action of 1,25-(OH)₂D (Dawson-Hughes, 1996; National Institutes of Health, 1994). The body can produce Vitamin D by a photochemical reaction that occurs in the skin when exposed to ultraviolet light. However, a majority of the U.S. population does not receive adequate sun exposure to allow formation of enough vitamin D to meet the RDA; therefore, a regular dietary supply of vitamin D is needed. Dairy foods are the primary food source of vitamin D, but small amounts of vitamin D are found in eggs and fortified margarine (Ziegler and Filer, 1996). Currently, approximately 98% of the milk in the U.S. is fortified with vitamin D at a level of 10 micrograms per quart (Miller et al., 1995a). The current RDA for vitamin D is 5 micrograms per day for adult women (Food and Nutrition Board, 1989).

The presence of lactose has been shown to increase the absorption of calcium in animal studies; however, the effect of lactose on calcium absorption has not been demonstrated consistently. It is thought that lactose increases passive diffusion of calcium, but beyond this mechanism it is not known why lactose might increase the rate of calcium absorption (Food and Nutrition Board, 1989; Hourigan, 1984).

Calcium in the American Diet

The per capita amount of calcium in the U.S. food supply has increased since 1970, when the amount of calcium available was 870 milligrams (Zizza and Gerrior, 1995). The per capita amount of calcium in the U.S. food supply in 1985 was over 900 milligrams (U.S. Dept of Health and Human Services, 1989). The amount of calcium in the food supply indicates that there is an adequate amount of calcium available to meet the RDA. The major sources of calcium in the

American diet are milk and milk products (National Academy of Sciences, 1997). Green vegetables, fruits, seeds, fish eaten with their bones, and in some instances depending on location the water supply also contribute calcium to the American diet (Fleming and Heimbach, 1994).

At present there is not adequate information available to indicate a biologically important difference in the absorption of calcium from different foods (Food and Nutrition Board, 1989). However, the bioavailability of calcium is greater in certain foods. Calcium found in dairy foods is more bioavailable and therefore more readily absorbed than that found in vegetable or grain sources. Vegetable and grain sources of calcium contain high levels of oxalic acid (e.g. spinach) and/or phytic acid (e.g. wheat bran) which inhibit the absorption of calcium (Miller et al., 1995a; Packard and Heaney, 1997).

Food sources, such as dairy products and calcium-fortified foods, are the preferred method of providing calcium (Beatty and Finn, 1995; National Institutes of Health, 1994; Packard and Heaney, 1997). Dairy products are the leading source of calcium in the American diet because they are the most concentrated form of dietary calcium (Hourigan, 1984; Pao and Mickle, 1981; Zizza and Gerrior, 1995). In a study conducted by Parent et al. (1993) on 35 healthy women 50-65 years of age, dairy products such as milk, cheese, and chocolate flavored milk-based beverages contributed approximately 60% of the total calcium intake of the study group. In another study of non-Hispanic white, non-Hispanic black, and Hispanic females 11-74 years of age, dairy products contributed between 50% to 65% of the study groups' daily calcium (Looker et al., 1993). Studies have shown that women receiving adequate calcium in the diet obtain the majority of calcium from dairy products (Behlen, 1986). In a study by Parent et al. (1993), the intake of calcium from dairy foods was relatively stable between the ages of 20 and 50, and after the age of 50 there was an increase in the intake of calcium from dairy products.

The Food and Nutrition Board (1989) reported that diets that include dairy products on a regular basis can meet the RDA for calcium. At present for adults, the recommended number of servings of dairy products to meet calcium needs is 2-3 per day (Weaver and Plawecki, 1994). Intake of other essential nutrients, such as protein, vitamin D, vitamin A, vitamin B₆, zinc, magnesium, and potassium, are significantly higher when dairy products are regularly included as a part of the diet (Fleming and Heimbach, 1994; Miller et al., 1995a).

When dairy foods are excluded from the diet, individuals may have a difficult time obtaining adequate calcium through diet alone to meet the RDA (Weaver and Plawecki, 1994). It has been recommended that the calcium content of foods be increased by direct fortification or by using milk as an ingredient to help obtain an adequate calcium intake. The use of calcium fortified foods can increase calcium intake without major changes in food habits. Already 20% of the total dietary intake of calcium in the U.S. comes from milk used as an ingredient in foods (Anonymous, September/October 1997; Fleming and Heimbach, 1994).

Supplements can also be used to help meet the RDA for calcium (Fleming and Heimbach, 1994). Today in the U.S. vitamin and mineral supplements are one of the leading non-prescription pharmaceuticals consumed on a regular basis. However, the people most likely to

use supplements are those people who are less likely to need them (Koplan et al., 1986). Supplements are more common among older persons, whites, and those with higher incomes and education. It is estimated that 33-72% of older adults use micronutrient supplements either as a single nutrient or in a combination. Women of all ages are more likely than men to consume supplements on a regular basis (Koplan et al., 1986; Krummel and Kris-Etherton, 1996; Tripp, 1997). In a study by Eddy (1997), results indicated that many women over age 65, who participated in focus group discussions, were using calcium supplements, particularly Tums®. Participants strongly thought of calcium in relation to the prevention of osteoporosis.

Vegetarianism

More adults, especially women, are adopting vegetarian diets citing health, environment, and animal rights as reasons for doing so (Janelle and Barr, 1995). Approximately twelve million Americans follow some form of vegetarian diet, and approximately 4% of American women are vegetarians (Behlen, 1986; Miller et al., 1995b).

The vegetarian diet can be nutritionally adequate when well planned, but vegetarian diets are typically low in vitamin B₁₂, calcium, and iron and high in fiber. The high intake of fiber may interfere with the absorption of calcium (Janelle and Barr, 1995; Miller et al., 1995a).

The abundance of calcium in dairy products makes dairy products an ideal source of protein and calcium for the vegetarian (Miller et al., 1995a). The majority of vegetarians include some dairy in the diet (Janelle and Barr, 1995). Calcium intake of vegetarians that eat dairy products is similar to the intake of non-vegetarians (Weaver and Plawecki, 1994). Vegetarians tend to have calcium absorption that is as good as if not better than that of people who include meat in their diets because of their lower protein intake (Dwyer, 1988).

The vegan diet is the most restrictive vegetarian diet. Vegans' average daily intake of calcium and vitamin D are usually much lower than the RDA. The low intake of these essential nutrients could hinder bone growth. The vegan diet is also high in phytates and oxalates that hinder the absorption of calcium (Dwyer, 1988; Janelle and Barr, 1995). However, vegans' low calcium intake may be less of a problem than once believed because low protein intake decreases the amount of calcium excreted in urine (Janelle and Barr, 1995).

Women's Calcium Intake in the U.S.

According to the Second National Health and Nutrition Examination Survey (NHANES II), approximately 75% of adult women in the U.S. do not consume adequate calcium to meet the RDA. The average daily intake of dietary calcium for women 25-50 years of age in the U.S. is approximately 574 milligrams according to data from NHANES II (Miller et al., 1995b; Murphy et al., 1992). Preliminary data from NHANES III indicated that the median and mean intakes of calcium for the majority of U.S. women are not adequate to meet the RDA of 800 milligrams per day (Alaimo et al., 1994). Approximately 20% of the female population in the U.S. achieve the RDA for calcium (Millen et al., 1997), and the 1987 National Health Interview Survey (NHIS) reported that only 10% of women consume greater than 1,100 mg of calcium per day on a regular basis (Miller et al., 1995b). The 1987 to 1988 National Food Consumption Survey (NFCS)

reported that the average daily dietary calcium intake of women ages 30 to 39 and ages 40 to 49 are 599 milligrams and 557 milligrams, respectively (Fleming and Heimbach, 1994). In the Framingham study, the average calcium intake of the non-Hispanic, white women ages 12-60 was 599 milligrams per day. The calcium intake in both studies is considerably lower than the current RDA (Millen et al., 1997). The USDA's Human Nutrition Information Services (HNIS) indicated that the average daily calcium intake of women ages 35 to 50 increased significantly between 1977 and 1985 (Behlen, 1986). However, other surveys reveal that the average daily calcium intake of women has not significantly improved over the past 20 years (Miller et al., 1995b).

Overall it has been noted that women 40 to 49 consume less calcium than do women 20 to 29 (Miller et al., 1995b). However, the women tend to consume a similar percentage of the RDA for calcium, mainly due to the fact that the RDA for calcium decreases after age 25 (Looker et al., 1993). However, the NIH recommendation for calcium increases with age, especially following menopause (National Institutes of Health, 1994).

Chapman et al. (1995) studied factors that influence calcium intake in women. A questionnaire was used to collect data and dietary calcium intake was assessed with a food frequency questionnaire. Results indicated that 43.2% of the women had reported calcium intakes below 60% of the RDA. Approximately 11.4% of these women had dietary calcium intakes below 20% of the RDA and were considered to be at significant risk. Many of the women with dietary calcium intakes below 60% of the RDA reported limiting milk intake because milk "upset their stomach". Of the women consuming adequate amounts of dietary calcium, most expressed concern over calcium intake and reported liking milk. The most interesting finding of the study was that 27.1% of the women with dietary calcium intakes below 60% of the RDA thought they were meeting the RDA for calcium. Additionally, there were no significant differences found between the calcium intake of women under the age of 50 and those women over the age of 50 (Chapman et al., 1995).

Despite efforts to increase calcium intake in all age groups of U.S. women, the average daily calcium intake for women in the U.S. remains well below the current RDA and current recommendations for optimal bone health (Repka, 1993). Research indicates that diets low in dairy products often result from poor food habits (Miller et al., 1995b). The exclusion of dairy foods limits the intake of calcium, and poor dietary intake of calcium poses a significant problem to public health (Pao and Mickle, 1981; U.S. Dept. of Health and Human Services, 1989).

The Surgeon General's Report on Nutrition and Health (1988) recommended that adolescent girls and adult women increase consumption of foods high in calcium, such as dairy foods. According to the U.S. Department of Health and Human Services (1992), in 1985 and 1986 only 15% of women ages 25 to 50 consumed two or more servings of calcium rich foods per day. One of the objectives of Healthy People 2000 is to increase the number of individuals over the age of 25 that consume two or more servings of calcium rich foods per day to at least 50%. The 1994 Review of Healthy People 2000 indicated that the percentage of women ages 25

to 50 consuming two or more servings of calcium rich foods increased from 15% to 16% (U.S. Dept. of Health and Human Services, 1994).

Physical exercise as well as food patterns can influence the calcium needs for some individuals (Weaver and Plawecki, 1994). In a position paper on women's health, The American Dietetic Association (ADA) and The Canadian Dietetic Association (CDA) recommended that women consume a diet rich in calcium and incorporate exercise into their daily routine (Beatty and Finn, 1995).

The associations between dietary calcium intake and some social and demographic factors have been studied. Reports from these studies indicate that the taste of milk and the social environment in which milk is consumed contribute significantly to the intake of milk (Miller et al., 1995b). Calcium consumption has been found to be highest among whites (Fleming and Heimbach, 1994). Calcium intake is greater in women with middle to high incomes than in women with lower income. It is also reported that women with high education levels, especially a college degree, have a greater calcium intake (Behlen, 1986; U.S. Dept of Health and Human Services, 1989). The USDA's HNIS reported that the calcium intake of women employed either full-time or part-time does not differ from the calcium intake of those women not working outside the home. The USDA's HNIS reported that calcium intake of women with children was significantly higher than the calcium intake of women without children (Behlen, 1986).

Food Choice Models

Food provides needed nutrients to the body, but it also has a psychological significance that is secondary for many consumers. A person selects food rather than the nutrients they choose to consume (Khan, 1981). Food choices people make determine the nutrients that enter the body and influence the food industry through consumer demand. Food choice behavior incorporates those decisions that are conscious and those that are automatic, habitual, and subconscious (Furst et al., 1996). Food choice models are used to represent the relationships between factors that affect food choices. Most food choice models are qualitative and do not identify the relative importance or specific interactions between factors; however, food choice models are useful in understanding likely influences (Shepherd and Sparks, 1994).

A model developed by Khan (1981) divides factors related to food choice into seven interrelated categories. The seven factors in Khan's model are: 1) personal factors like familiarity, emotional meaning associated with food, and influence from other persons; 2) biological, physiological, and psychosocial factors such as age and gender; 3) extrinsic factors such as advertising and seasons; 4) intrinsic factors of the food such as taste, texture, and appearance; 5) cultural, religious, and regional factors such as geographical location; 6) educational factors such as nutrition education; and 7) socioeconomic factors such as food cost and income.

A second model developed by Randall and Sanjur (1981) is a three-part food preference model. The three categories include characteristics of the individual, food, and environment.

Characteristics of the individual include age, gender, education, nutrition knowledge, cooking skills, and attitudes to health and the role of food to health. Characteristics of the food include taste, texture, cost, preparation method, seasoning, combination of foods, and appearance. Characteristics of the environment include season, employment, family size, stage of family, degree of urbanization, and mobility (Randall and Sanjur, 1981).

Another three-part model was developed by Furst et al. (1996); the three interrelated factors were life course, influences, and personal system. Life course includes personal roles and the social, cultural, and physical environments to which a person is exposed. The life course generates the influences, which are the second component. Influences are divided into five main categories: ideals, personal factors, resources, social framework, and food context. The influences shape, reinforce, interact, and compete with one another in influencing food choices. The third component, personal system, is composed of two components, value negotiation and strategies, involved in food choice patterns. Value negotiations involve weighing and accommodation of those values that are important to the individual, such as sensory perception, monetary considerations, convenience, health and nutrition, and quality. Strategies are guides to food choices and tend to be routine and stable with some degree of flexibility (Furst et al., 1996).

From the models discussed above, variables influencing food choices can be divided in those related to food, to the individual making the food choices, and to external factors (Shepherd and Sparks, 1994).

Product Trends in the Dairy Industry

Factors that Influence Consumption of Dairy Foods

The food choices people make determine the nutrients that enter their body and influence the food production systems through consumer demand (Furst et al., 1996). There are a variety of motives that affect consumption of dairy foods, such as increased consciousness of health, the like and dislike of products, the departure of children from the home, and availability and price of dairy foods. Increased interest in health and nutrition has influenced consumer perception of dairy foods. At present, dairy foods are generally accepted by consumers as nutritious and healthy foods. However, consumers increasing interest in health and nutrition has influenced the consumption of some dairy foods, because of their association with cholesterol, fat, kilocalories, and heart disease (Light et al., 1992). Eddy (1997) found the predominant negative health perception held by educated women over age 65 was that many dairy foods are high in fat. Women also associated dairy foods with cholesterol, sodium, and kilocalories.

The dairy industry's growth in 1995 and 1996 reflect that the industry has responded to the demands and desires of the consumer (Parent et al., 1993). To further increase sales of dairy products the industry may start to use label claims, such as "excellent source of calcium and vitamin D" and claims that relate to an association between calcium and osteoporosis. The industry may also decrease the use of terms that have little meaning to consumers, such as "homogenized" and "pasteurized" (Anonymous, October 1996; Miller et al., 1995b). Information about the product provided on the food label may help alert consumers to the benefits of dairy

foods and modulate the perceived risks. Consumers demand easy to read food labels but studies indicate that consumers do not use food labels on a regular basis (Light et al., 1992).

The consumption of lower fat dairy foods has increased as the intake of whole fat dairy products has declined. Between 1989 and 1991, 57% of women consuming dairy products reported consuming some lower fat dairy products (Krummel and Kris-Etherton, 1996). The lower fat dairy products are lower in fat, but contain the same quantity of nutrients like calcium (National Institutes of Health, 1994). Low-fat dairy foods are usually more expensive and may have undesirable sensory properties because of reduction in fat content.

Nutrient content, price, and sensory properties often affect the acceptance of low-fat dairy foods. Most consumers are not willing to give up taste for health, so lower fat dairy products can taste different from the higher fat products, but the taste must be as acceptable as the higher fat products (Guinard and Marty, 1997). Eddy (1997) found that "taste good" was one of the main reasons for selecting food in educated women over the age of 65. However, results also indicated that health perceptions and sensory attributes of the food interact to affect dairy food choices (Eddy, 1997).

Guinard and Marty (1997) found that women liked regular fat and low-fat dairy foods, but regular fat dairy foods were liked more than lower fat dairy foods. Women reported liking whole, low fat, and skim milk the same, but they were more likely to purchase the low fat and skim milk (Guinard and Marty, 1997).

The price of dairy foods increased slightly between 1994 and 1996. The increase in price did not decrease the sale of dairy foods because the total sale of dairy foods hit a record high in 1995 and continued to show growth in 1996. The demand for dairy foods is projected to continue (Anonymous, October 1996; Clauson, 1995). Dairy foods continue to be an integral part of the American diet accounting for greater than 10% of the total food dollar spent in the U.S. (Anonymous, October 1996).

Consumption of Fluid Milk

There was an increase in fluid milk consumption in 1995 following a two-decade decline in fluid milk consumption. Programs like Milk PEP (the Milk Processor Education Program) and the "milk mustache" campaign, which target people 25-44 years of age, are credited with the increased consumption of fluid milk (Anonymous, October 1996; Anonymous, February 1996).

Increased consumption of soft drinks may be one factor related to decreased milk consumption. Soft drinks are presently the number one beverage consumed in the U.S. The price of soft drinks is lower than that of fluid milk. The price difference between milk and soft drinks may be partially responsible for the decreased consumption of milk. Also, the increased consumption of meals away from home, especially fast food, and the increased consumption of salty snack foods favor the consumption of soft drinks (Putnam and Duewer, 1995).

Research indicates that major reasons for the decrease in milk consumption are concerns

about the fat content and the false belief that lower fat milk contains fewer nutrients (Putnam and Duewer, 1995; Senauer et al., 1991). Horwath et al. (1995) reported subjects, women 19-23 years of age and women 72-95 years of age, decreased milk consumption as a result of health concerns over fat and obesity, change in lifestyle, and dislike of milk. Many participants in the study thought that increased milk consumption would either have no effect or have an adverse effect on health. In the study, 13% of the women had been advised by a health care provider, usually a physician, to eliminate milk or dairy foods (Horwath et al., 1995). Eddy (1997) found that physicians were the primary influence on many aspects of women's health, including the consumption of dairy foods and the use of calcium supplements. Cortez and Senauer (1996) found that the preference for milk is higher in lower income households with younger heads and lower in households with higher income, older heads, and less-educated spouses. However, the study indicated that preference for milk was not an indicator of actual changes in the consumption of milk between 1980 and 1990 (Cortez and Senauer, 1996). Research by KRC Research and Roper Starch Worldwide identified seven key attitudes and misperceptions that influenced women to not drink milk. The seven key attitudes include the following: 1) milk is a high fat food that causes obesity and heart disease; 2) lower fat milk does not have as many nutrients as whole milk; 3) only kids' drink milk; 4) milk is a boring beverage; 5) milk does not complement many foods; 6) milk tastes bad; and 7) milk is not a convenient beverage (Anonymous, February 1996). Eddy (1997) found that some women over the age of 65 thought milk was for children. A nationwide survey on milk consumption conducted in 1987 and the 1989 Prevention Index reported that half of the participants were concerned about the fat and cholesterol in dairy foods. A significant correlation was found between these concerns and decreased milk consumption, especially in women (Finn, 1997; Senauer et al., 1991). Educational programs have been initiated and follow-up research has shown that knowledge about the nutritional make-up of lower fat dairy products are better known (Putnam and Duewer, 1995).

The increase in the consumption of low-fat milk the past three decades has been substantial. The consumption of whole milk stabilized in 1995 after a significant period of decline (Krummel and Kris-Etherton, 1996). The sales of skim milk continued to increase, and skim milk was the only beverage milk that had an increase in consumption in 1994 (Putnam and Duewer, 1995).

The types of milk that provide calcium in the diet have shifted over the past three decades. In 1970, whole milk contributed 37% of dietary calcium, but in 1990, whole milk contributed only 15% of dietary calcium. Lower fat milk now provides the majority of dietary calcium that comes from beverage milk (Zizza and Gerrior, 1995). The proportion of women consuming lower fat milk increases with age (Krummel and Kris-Etherton, 1996).

Consumption of Cheese

The consumption of cheese accounts for approximately 17% of all dairy food consumption, and is the largest provider of dietary calcium. Much of the increase in cheese consumption is due to the increased consumption of pizza (Senauer et al., 1991).

The fat content of cheese is not perceived to be as visible as the fat in other high fat foods, such as beef. This could be one reason that the consumption of cheese has not declined along with other high fat foods. In fact, the consumption of cheese by women of all ages has almost doubled since 1965 (Krummel and Kris-Etherton, 1996; Putnam and Duewer, 1995). The consumption of cheese has not declined, but consumers are becoming more concerned about the fat content of foods. Consumers concern over fat in cheese has prompted the start of programs by the National Cheese Institute (NCI) and Dairy Management Incorporated (DMI) to increase consumer awareness of the benefits associated with cheese (Anonymous, February 1996).

Regular fat cheeses dominate the cheese market accounting for 77% of the market, but the sale of reduced fat cheeses and fat free cheeses continues to increase (Anonymous, October 1996). Undesirable sensory qualities have been associated with the limited use of reduced fat cheeses in the past (Krummel and Kris-Etherton, 1996). The sensory qualities of the reduced fat cheeses still play an important role in their use. Vickers and Mullan (1997) found that adults 22-30 years of age preferred high fat cheese to the fat-free cheese in a sensory test and post-consumption ratings sensory test. Light et al. (1992) found that adults preferred high fat cheese to lower fat cheeses when fat content was unknown as well as when fat content was known.

Consumption of Other Dairy Foods

The concern over fat in dairy products has influenced the sale of frozen dairy products. Frozen yogurt sales have increased over 170%, while ice cream sales have declined slightly. The significant increase in frozen yogurt sales indicates an overall increase in frozen dairy product consumption (Senauer et al., 1991). The consumption of regular and low-fat frozen dairy products increased 10% between 1989 and 1993 (Frazao and Allshouse, 1996). Research indicates that 98% of all American households consume some ice cream. Ice cream consumption tends to increase with higher income and education (Senauer et al., 1991). Cross et al. (1994) found that ice cream was at the top of the evening snack list for Americans, and ice cream was the second most popular evening snack among adults. Light et al. (1992) found that regular fat ice cream was preferred significantly over lower fat versions.

The consumption of non-frozen yogurt has increased almost threefold since the 1970's (Putnam and Duewer, 1995). The total volume sales of yogurt increased 17% between 1989 and 1993. The sale of low-fat yogurt increased to offset the decrease in the sale of regular yogurt (Frazao and Allshouse, 1996). The increase in yogurt consumption has helped to partially offset the decline in fluid milk consumption. Cottage cheese consumption has declined steadily since the 1970's (Putnam and Duewer, 1995; Frazao and Allshouse, 1996). The consumption of sour cream increased 14% between 1989 and 1993. This increase is in part due to the increased consumption of lower fat sour creams (Frazao and Allshouse, 1996).

Demographics of Study Population

The state of Virginia is the twelfth most populous state in the U.S. In 1995, 74.2% of

Virginia's population was non-Hispanic white. By the year 2025, it is projected that Virginia will be the state with the thirty-ninth highest proportion of elderly people over the age of 65 (Campbell, 1996).

The Baby Boom

The Baby Boom was a post World War II phenomenon that offset a century long decline in births. The surge in births started in 1946 when over 3,400,000 babies were born, and the birth rate remained over 4,000,000 until 1964. Births peaked at over 4,300,000 in 1957. The Baby Boomers, now 75,000,000 strong, are one of the largest generations in U.S. history and account for 42% of the adult population (Gerber et al., 1989; Light, 1988; Russell, 1993). Women are the majority in the Baby Boom generation (Light, 1988). The Baby Boomers are commonly split into two groups, the early boomers (1946 to 1954) and the late boomers (1955 to 1964) (Congressional Budget Office, 1993).

As the Baby Boom generation ages, the number of Americans in the 35 to 50 age range will continue to rise in the 1990's. The first of the Baby Boomers are turning 50. By the time the last of the Baby Boomers turn 65, more than 20% of the U.S. population will be over the age of 65, thereby causing an increase in the number of people over the age of 65 from 32 million to 65 million (Chernoff, 1995).

Economics

The Baby Boom generation is the most diverse in history, but they also have much in common. The Baby Boom generation like most generations has some rich and some poor (Light, 1988). The Baby Boom generation is often classified as the "yuppie" generation, but this stereotype is inaccurate. "Yuppies" are defined as adults 25 to 39 years of age living in a metropolitan area that work in a professional or managerial occupation. Only 4,000,000 of the Baby Boomers qualify as "yuppies". The remainder of the generation is middle class, blue collar, single parents, and minorities. However, the majority of Baby Boomers do have a better economic status than their parents. This phenomenon may be due to the fact that Baby Boomers started out better than their parents did, and this advantage was maintained throughout life. The Baby Boomers economic status may also be a result of avoiding parenthood and opting for childless living arrangements (Easterlin et al., 1990; Light, 1988).

Baby Boomers as a generation have a better economic status than previous generations, but there is also a greater inequality in the distribution of income and wealth (Easterlin et al., 1990). Twenty-two percent of the non-Hispanic white women live below the poverty line (Chernoff, 1995).

Social Views

The Baby Boomers tend to have more liberal social views than those of their parents, and as a result they tend to be more tolerant of social diversity (Light, 1988). Baby Boomers tend to reject established institutions; therefore, the Baby Boom generation as a whole tends to be more individualistic (Food Marketing Institute, 1997).

Family

It has been noted that larger cohorts, for example Baby Boomers, tend to have smaller families as a result of less economic success (Congressional Budget Office, 1993). The family of Baby Boomers are more likely to be smaller, headed by a single parent, more likely to divorce, and more likely to have two working parents (Easterlin et al., 1990; Light, 1988). In households where the couple is married, the wife is likely to work outside the home (Congressional Budget Office, 1993).

Women in the Work Force

Women in the Baby Boom generation tend to be very career oriented, and in most cases the women's work outside the home adds to family responsibilities. As a result, many women are stretched between dual careers, at home and at work (Light, 1988). Approximately 75% of the women in the work force are employed full-time (Russell, 1993). Data from the 1985 Continuing Survey of Food Intake by Individuals (CSFII) show that women between the ages of 19 and 54 employed full-time have lower average intakes of milk, cereals, and pasta but also have higher average intakes of fats, oils, beverages, and salad dressings (Krummel and Kris-Etherton, 1996).

Studies have found that women employed full-time spend less time preparing meals by using more convenience foods and by eating out more often. It is estimated that 75% of women in their 40's eat out an average of once every three days. Those women who tend to eat out at fast food restaurants have higher intakes of fat and decreased intakes of calcium, fiber, folacin, vitamin A, and vitamin C (Krummel and Kris-Etherton, 1996). Women over the age of 50 like to eat out also, and women over the age of 50 tend to get "take-out" at least once a month (Sloan, 1997).

Education

Baby Boomers value education and are one of the best-educated generations in history. Almost 90% of Baby Boomers finished high school, and 22% graduated from college (Light, 1988). Those people with more education tend to be more adventuresome in their food choices and adopt new foods into their diet more quickly. Baby Boomers tend to search for new products to replace old products (Senauer et al., 1991).

Baby Boomers as Consumers

Baby Boomers define contemporary culture and shape the economy. This generation is marked by their trendiness. They embrace the "in" thing and then quickly change it when it is no longer trendy (Light, 1988). Future buying trends of the Baby Boomers might be influenced by flavor, demand for healthy foods, price, and convenience (Food Marketing Institute, 1997). Many things influence the eating patterns of women, such as greater number of women in the work force, rise in female headed households, increased availability of convenience and commercial foods, and use of tobacco (Krummel and Kris-Etherton, 1996). Food consumption of women in the U.S. today is influenced by the environment in which the food is selected, cultural preferences, personal preferences, economic conditions, and level of education (Krummel and Kris-Etherton, 1996).

The Baby Boomer's high level of education makes them great consumers of information (Chernoff, 1995). Baby Boomers are more likely than past generations to ask the "tough questions" about a product because they are more interested in benefits the product offers them. Baby Boomers also are more likely to buy generic or store brand products and are more suspicious of advertising than past generations (Food Marketing Institute, 1997; Light, 1988).

Food preferences are transferred from the parents to the child, so food preferences might be more acquired than they are inborn (Furst et al., 1996; Wyricka, 1981). In a study done by Stafleu et al. (1995), food habits of daughters resembled the food habits of the mothers. Stafleu et al. (1995) concluded that nutrition habits were transferred from mother to daughter because 69% of the participants in the study reported adopting nutrition habits from their mothers.

A survey was conducted recently to determine how people in the U.S. make food choices. Women in the study reported that they got the majority of their information about food and nutrition from magazines, newspapers, and television. However, less than 10% of the women reported changing food habits due to what they read in magazines and the newspaper and from what they heard from the television (Krummel and Kris-Etherton, 1996). This lack of change in food habits could be a result of consumers' confusion regarding conflicting messages from different sources and studies (Food Marketing Institute, 1997).

Health Practices

Baby Boomers will likely reject the symptoms of aging. They want to know how to improve the quality of their life as well as how to live longer (Anonymous, March/April 1997). Overall Baby Boomers have better health practices, which include increased physical exercise, lower rates of smoking, healthier diets, and a greater awareness of preventive health, than their parents (Chernoff, 1995).

A survey, Trends in United States: Consumer Attitudes and the Supermarket 1996, found that Baby Boomers are very concerned about the nutritional content of food. In fact, more than 78% of the participants, 40 to 49 years of age, chose foods for health reasons most of the time, and at least 45% of the women in the survey maintained a low fat diet for health reasons (Anonymous, March/April 1997). Sloan (1997) reported that women between the ages of 50 and 64 were more likely to change their eating habits for health reasons. This emphasizes the findings of Stafleu et al. (1995) that attitudes about health tend to increase in importance as women age.

Baby Boomers claim to be very health conscious, but the American diet has not become more healthful (Anonymous, March/ April 1997). Low-fat foods are becoming more accessible because of increased demand for such food items (Russell, 1993). Results of one study, indicated that middle age and younger women had a low preference for high fat and high cholesterol food items (Stafleu et al., 1995). The physical fitness craze started in the 1970's and 1980's as a result of Baby Boomers being uncomfortable with physical decline. The physical fitness craze has since matured into the wellness craze. As many as four out of ten Baby

Boomers exercise several times a week (Russell, 1993; Senauer et al., 1991).

It is predicted that Baby Boomers will have better health when they reach their 60's and 70's than previous generations, and they can expect to live longer than their parents and grandparents. Female Baby Boomers can expect to reach the age of 80. Their health status is in part due to a combination of unique life experiences, such as better prenatal care, childhood vaccines, and better nutrition (Light, 1988; Chernoff, 1995).

Health and Dairy Foods

The greatest consumers of health care are women. Since the turn of the century the life expectancy of women has increased from 48 years to 79 years. Women's life expectancy is approximately 7 years longer than that of men (Finn, 1997). Because of their longer life expectancy, women face a greater risk of disease and disability (Beatty and Finn, 1995). The 1993 ADA Survey of American Dietary Habits found that women are more concerned about good nutrition than men. Women indicated greater levels of care in selecting foods than men. Women between the ages of 35 and 54 also were the most receptive to information about changing dietary habits to be more healthful (Millen et al., 1997). However, less than one third of the women had actually implemented any form of dietary intervention to decrease the risk of hypertension, heart disease, cancer, and osteoporosis (Beatty and Finn, 1995).

Chronic diseases account for more than three-fourths of all deaths in the U.S. (U.S. Dept of Health and Human Service, 1990). Proper screening for risk factors related to chronic disease followed by proper intervention may make a difference in incidence or slow the progression of many age-related chronic diseases (Chernoff, 1995).

Many of the diseases that low calcium intakes have been linked to are diseases related to aging (Fleming and Heimbach, 1994). For example, low intake of calcium has been related to increased risk of hypertension, osteoporosis, and colon cancer (Looker et al., 1993; Millen et al., 1997). There are an increasing number of research studies that show the benefits of calcium in chronic disease reduction (Miller et al., 1995a; National Institutes of Health, 1994).

Cardiovascular Disease

Results of national health surveys indicate that cardiovascular disease (CVD) is the leading cause of death in women in the U.S. and in the state of Virginia (Center for Health Statistics, 1991; National Center for Health Statistics, 1996). In 1991, it was estimated that CVD would affect more than one in every five Americans sometime during their life (Ziegler and Filer, 1996). Advances have been made in the reduction of CVD mortality, but CVD continues to affect approximately 7 million Americans, causing an estimated 500,000 deaths each year (U.S. Dept. of Health and Human Services, 1992). Early intervention or reduction of risk factors associated with CVD is a major health goal in the U.S. (Miller et al., 1995a).

High level of cholesterol in the blood is one of the major modifiable risk factors for CVD. Some recent studies indicate that reduction of total cholesterol and low density lipoprotein

(LDL) cholesterol levels and increase of high density lipoprotein (HDL) cholesterol levels may help to reduce the risk of CVD (Krummel and Kris-Etherton, 1996).

There is substantial evidence to indicate that diet has a significant role in influencing blood cholesterol levels (Miller et al., 1995a). However, response to dietary changes in fat and cholesterol consumption may vary. This variability may be partially explained by genetic traits (National Dairy Council, 1994). The intake of fat has received the majority of attention as a dietary factor related to cholesterol levels in the blood. High intakes of fat, especially saturated fat, and cholesterol are associated with increased levels of total cholesterol and LDL cholesterol (Miller et al., 1995a). Intake of fat in the U.S. is generally well above the recommended levels of 30% or less of total kilocalories. Guinard and Marty (1997) found that an average of 37% to 40% of total daily kilocalories in the average U.S. diet come from fat. Recent data indicate that women's average fat intake has decreased to approximately 34% of total kilocalories, a level that is still above the recommended amount (Guinard and Marty, 1997; Krummel and Kris-Etherton, 1996).

The perception that dairy foods are high in fat and cholesterol could be one reason for the decreased consumption of dairy products. However, the over all contribution to fat and cholesterol intake by dairy foods is relatively small when compared to the fat and cholesterol contributed by meat, poultry, fish, and fats and oils. Dairy foods contributed 12% of the total fat, 20% of the saturated fat, and 15% of the cholesterol to the U.S. food supply in 1990 (Miller et al., 1995a; National Dairy Council, 1994).

At present, there are no studies indicating that intake of dairy products in usual amounts along with a healthy diet adversely affect cholesterol and lipoprotein levels in the blood or increase the risk of CVD (Miller et al, 1995a; National Dairy Council, 1994). Milk has a unique fatty acid profile that does not increase blood lipid levels (Berner, 1993; National Dairy Council, 1994). The fatty acid composition is unique because approximately 59% of fatty acids are 1) short-chain saturated fatty acids such as butyric, caproic, caprylic, and capric; 2) stearic acid; 3) monounsaturated fatty acids such as palmitoleic and oleic; 4) polyunsaturated fatty acids like linoleic and linolenic; and 5) traces of other fatty acids that are not hypercholesterolemic (Berner, 1993). Not only do many of the fatty acids not increase blood lipid levels, but nutrients found in milk, such as calcium, may have a positive effect on blood lipid levels by increasing the excretion of saturated fatty acids (Denke et al., 1993; National Dairy Council, 1994).

Hypertension

Hypertension is defined as persistently high arterial blood pressure, and is diagnosed when blood pressure remains above 140/90 for a period of time. High blood pressure affects more than 62 million Americans and plays a major role in the incidence of stroke and heart disease. Hypertension has few warning signs and has quickly become the fourth largest public health concern because of its reputation as the "silent killer" (Williams, 1993). Hypertension is more prevalent in the elderly (Miller et al., 1995a).

An optimum intake of calcium, magnesium, and potassium is suspected to assist in

lowering blood pressure. Dairy products are an important source of these nutrients and may therefore play a beneficial role in reducing the risk of hypertension (National Dairy Council, 1994; Joffres et al., 1987).

Some studies have demonstrated an inverse relationship between increased consumption of calcium rich foods, like dairy products, and a reduction in blood pressure. Many of the studies indicate that consumption of dairy products causes a more significant decrease in blood pressure than calcium or potassium alone. This finding indicates that a combination of these nutrients may be more effective in lowering blood pressure (Joffres et al., 1987; Miller et al., 1995a). Adequate dietary intake of magnesium is also associated with lowering blood pressure. One study performed on nurses revealed that those consuming at least the minimum RDA for magnesium reduced their risk of hypertension by one-third (Miller et al., 1995a). However, not all of the studies support the findings of calcium, potassium, and magnesium providing a beneficial role in blood pressure reduction (Chapman et al., 1995; Miller et al., 1995a; Ziegler and Filer, 1996).

Colon Cancer

Colon cancer is the third leading cause of death from cancer in the U.S. In 1993, 57,000 Americans died from colon cancer. Dietary factors, such as high fat intake, and a genetic predisposition, are thought to be responsible for the occurrence of colon cancer (Newmark and Lipkin, 1992; Miller et al., 1995a). Recent studies indicate that intake of dairy products, including whole milk, do not increase the risk of colorectal adenomas, a cancer precursor.

There may be an inverse association between intake of dairy products and colon cancer, lung cancer in nonsmoking women, and endometrial cancer (National Dairy Council, 1994; Centonze et al., 1994). Several components of dairy products, for example calcium, vitamin D, bacterial culture (*Lactobacillus acidophilus*), and a class of fatty acids called conjugated dienoic derivatives of linoleic acid (CLA), have been found to be protective against some forms of cancer (Newmark and Lipkin, 1992; Miller et al., 1995a). Bile acid and free fatty acids cause damage to the epithelium of the colon and increase epithelial cell proliferation. Calcium provides a protective effect by binding bile and free fatty acids to form soaps that are excreted (National Dairy Council, 1994). Studies have found that a combination of calcium and vitamin D is needed to prevent colon cancer (Miller et al., 1995a). Conjugated dienoic derivatives of linoleic acid has been shown to prevent tumor growth in animals, but the effect of CLA in humans is unknown (National Dairy Council, 1994).

Osteoporosis

Osteoporosis is a disease characterized by low bone mass and microarchitectural deterioration of bone tissue which leads to bone fragility and increased risk of fracture (Mittlak and Nussbaum, 1993; Raisz, 1997). Osteoporosis is more prevalent in industrialized countries where there is an abundant supply of calcium rich foods, especially dairy products (Dwyer, 1988). In the U.S., osteoporosis is a major health problem affecting more than 25 million people. Approximately 80% of the people affected are women over the age of 45 (Finn, 1997;

Prestwood et al., 1995). Estimates from NHANES III indicated that 6-7 million women over the age of 50 are afflicted by osteoporosis of the hip (Zizza and Gerrier, 1995).

The increased risk of osteoporosis in women is probably a result of their lower initial bone mass and accelerated bone loss following menopause (Miller et al., 1995a). Women can lose as much as 15% of their bone density following menopause, but studies indicate that increased calcium consumption following menopause may reduce bone loss (Chapman et al., 1995). Osteoporosis is more prevalent among slender white women, particularly those of northern European ancestry (Raisz and Smith, 1989; Wardlaw, 1993). Women who cease to menstruate due to anorexia nervosa or excessive exercise are also at an increased risk for osteoporosis (Miller et al., 1995a).

In terms of health care, loss of productivity, and reduced quality of life osteoporosis carries a large cost (Raisz, 1997). Osteoporosis has no cure because bone loss cannot be restored once it is lost; therefore, the prevention or slowed progression of osteoporosis is the key (Wardlaw, 1993). Osteoporosis develops gradually over a period of years, so it may be years before clinical symptoms, such as loss of height, curvature of the spine, and fractures, become obvious (Beatty and Finn, 1995; Krummel and Kris-Etherton, 1996). Factors that contribute to development of osteoporosis have not been fully identified, but smoking, high caffeine intake, alcohol abuse, lack of exercise, being female, family history of osteoporosis, being underweight, estrogen deficiency, and low calcium intake increase the risk of developing osteoporosis (Dwyer, 1988; Prestwood et al., 1995).

Bones are the repository for 99% of the calcium in the body (Chernoff, 1991). The remaining 1% of the body's calcium is needed for proper functioning of the body. In the case of continued dietary deficiency bone is broken down to provide calcium for other body functions; therefore, adequate intake of calcium is necessary to prevent the depletion of bone (Ziegler and Filer, 1996). In a study by Eddy (1997), older women were aware of the relationship between calcium and osteoporosis. Inadequate dietary calcium intake is not the sole cause of osteoporosis, but it is one of the few controllable causes (Chapman et al., 1995).

Almost all research indicates that early awareness of the importance of dairy foods and lifestyle changes to increase the intake of calcium can significantly decrease the risk of developing osteoporosis (Anonymous, July/August 1997). Eddy (1997) found that women, over age 65, believed dairy foods were a good source of calcium and other nutrients, although they were unable to identify specific nutrients other than calcium. Calcium has the most impact on bone mineral density during the bone building years of childhood and early adulthood. Evidence suggests that an adequate intake of calcium and vitamin D throughout life allows the achievement of peak bone mass and can reduce age related bone loss. Achievement of peak bone mass and reduction of bone loss could reduce the risk of osteoporotic fractures by 50 to 60% (Murphy et al., 1994; Beatty and Finn, 1995; Miller et al., 1995a).

It is difficult to have an adequate calcium intake without the consumption of dairy products (Miller et al., 1995a). Dairy products also provide other nutrients, such as phosphorus,

that are needed to maintain bone mass (Raisz and Smith, 1989).

The term optimal calcium intake refers to the amount of calcium needed to reach peak bone mass, maintain bone mass, and minimize bone loss following menopause (Murphy et al., 1994; Weaver and Plawewski, 1994). The National Osteoporosis Foundation recommends the intake of 1,000 milligrams of calcium per day for the prevention of osteoporosis (Mitlak and Nussbaum, 1993), but the National Institute of Health recommends a higher intake of 1,500 milligrams per day (Finn, 1997).

In a person with osteoporosis, a fall, blow, or lifting action that would not injure a person with normal bone density could cause one or more fractures (Osteoporosis Consensus Conference, 1984). Osteoporosis is estimated to be responsible for 1.5 million fractures annually in the U.S. (Packard and Heaney, 1997). Non-Hispanic white women have a 40% higher risk of having a fracture than non-Hispanic black and Hispanic women. According to the National Osteoporosis Foundation, a woman's risk of hip fracture is equal to her combined risk of breast, uterine, and ovarian cancer (Miller et al., 1995a).

Osteoporotic fractures are a significant health problem because of their substantial morbidity and mortality. The American Dietetic Association reports that osteoporosis is one of the five leading causes of morbidity and mortality in North American women (Beatty and Finn, 1995). Only 25% to 50% of patients with osteoporotic hip fractures regain their initial level of functioning, and almost 20% will require some form of extensive medical care (Wardlaw, 1993). There is a substantial increase in mortality following hip fractures. A mortality rate of 5% to 20% makes hip fracture the most devastating manifestation of osteoporosis (Miller et al., 1995a).

The health care costs associated with acute care and rehabilitation following osteoporotic fractures are between 10 and 18 billion dollars annually (Zizza and Gerrier, 1995; Packard and Heaney, 1997). As Baby Boomers age, the proportion of the U.S. population over the age of 65 will increase dramatically, and this increase will significantly increase health care costs associated with osteoporosis. By the year 2040, the health care costs of osteoporosis will be approximately 50 billion dollars annually (Packard and Heaney, 1997; Raisz, 1997).

Lactose Intolerance

Lactose, a disaccharide composed of equal parts glucose and galactose, is the primary carbohydrate found in animal milk. The β -galactosidase enzyme lactase found in the intestine, is responsible for breaking down lactose (Miller et al., 1995a; Scrimshaw and Murray, 1988).

When a person is lactose intolerant they lack the ability to properly breakdown lactose. The undigested lactose then ferments in the intestine causing symptoms such as bloating, flatulence, abdominal distension, abdominal cramps, diarrhea, nausea, and loss of appetite (Hourigan, 1984). Approximately 25% to 28% of the U.S. population have an intolerance to lactose (Packard and Heaney, 1997; Miller et al., 1995a). Lactose intolerance is found in 6-12% of Caucasians in the U.S., and is more prevalent in Hispanics (26-53%), African Americans (60-75%), Native Americans (70-81%), and Asians (75-90%) (Miller et al., 1995a; Scrimshaw and

Murray, 1988).

There are three forms of lactose intolerance. Congenital lactose intolerance is lactase deficiency that occurs at birth. People with congenital lactose intolerance are unable to tolerate even small amounts of lactose and require a lactose-free diet. This form of lactose intolerance is extremely rare. The loss of lactase activity after weaning is known as primary lactose intolerance. The loss of lactase activity is actually the genetic norm. However, lactase activity is maintained in many white adults of Northern European ancestry. It is believed that continued lactase activity evolved in those populations that for geographical or cultural reasons depended on dairy products as important components of the diet. With primary lactose intolerance, people can often tolerate some dairy foods in their diet (Scrimshaw and Murray, 1988). Secondary lactose intolerance is a temporary condition that occurs as a result of some environmental factor that injured the intestinal mucosa where lactase is expressed (Unger and Scrimshaw, 1981; Miller et al., 1995a).

The response people with lactose intolerance have after consuming dairy foods is influenced by the lactose load, age, type of dairy food consumed, whether the lactose-containing food was consumed with a meal, and colonic compensation (Hourigan, 1984; Miller et al., 1995a). Cow's milk contains 4 to 5% lactose. Whole milk and chocolate milk appear to be better tolerated than the other types of milk. It is thought that the fat content of whole milk and chocolate milk slows gastric emptying, thereby increasing the lactose tolerance. In chocolate milk, the presence of other sugars may also influence the tolerance of lactose by affecting the rate of gastric emptying (Dehkordi et al., 1995).

Dried, condensed, and evaporated milk products have a greater percentage lactose than fluid milk (Scrimshaw and Murray, 1988). Fermentation reduces the level of lactose found in dairy products such as cheese and yogurt, so these dairy products may be better tolerated by people with lactose intolerance (Hourigan, 1984; Scrimshaw and Murray, 1988).

Lactose hydrolyzed milk and lactase enzyme tablets can be used to help prevent the occurrence of symptoms associated with the intake of dairy products; however, if milk is consumed in moderate amounts these may not be needed (Scrimshaw and Murray, 1988). Lactose hydrolyzed milk can be purchased in many grocery stores, but consumers can hydrolyze the milk at home. To hydrolyze milk the consumer adds a commercial preparation containing a neutral yeast, which is responsible for the production of β -galactosidase, to fresh milk and lets it stand for 24 hours. The disadvantages of hydrolyzing milk at home include having to wait 24 hours to consume the milk and a cost that is almost twice that of factory modified milk. At present extensive research is being done to find ways to improve and lower the cost of hydrolyzed milk and other dairy foods. The avoidance of dairy foods in people with lactose intolerance is associated with an increased risk of osteoporosis; therefore, the availability of lactose hydrolyzed-milk could help alleviate this potential problem (Hourigan, 1984; Scrimshaw and Murray, 1988). Eddy (1997) found that older women tended to avoid or limit dairy foods because of lactose intolerance. Lactase in tablet form is designed to increase the intestinal activity of lactase and offer the advantage of allowing the inclusion of a wider variety of dairy

foods in the diet (Miller et al., 1995a).

Sweet acidophilus milk is another option for people with lactose intolerance. Sweet acidophilus milk contains *Lactobacillus acidophilus* and is reported to decrease the symptoms associated with the consumption of dairy products. Sensory tests have shown that the taste of sweet acidophilus milk is indistinguishable from that of regular milk (Dehkordi et al., 1995; Hourigan, 1984).

CHAPTER III METHODS AND PROCEDURES

Introduction

The study included two pilot tests followed by four focus groups, to provide insight into perceptions of female Baby Boomers about dairy foods. Focus groups were preferred over more structured methods, such as quantitative surveys, for this study because focus groups allowed for insight into the participant's perceptions and opinions. A sequence of eighteen, open-ended questions were developed based on questions and procedures developed by Eddy (1997) and followed criteria cited by Krueger (1994). Questions were developed to address factors such as dairy foods often and seldom consumed, advantages and disadvantages of dairy foods, factors that influence consumption, possible product improvements, vitamin and mineral supplementation, and osteoporosis. The study was approved by the Institutional Review Board for Research Involving Human Subjects, at Virginia Polytechnic Institute and State University. All participants signed a consent form (Appendix A) before participating in either a pilot test or focus group.

Pilot Tests

Two pilot tests were conducted with women who were representative of the target audience. The foremost purposes of the tests were to evaluate the clarity of focus group questions, and make sure they stimulated the expected interaction among participants and elicited desired information. The pilot tests were also used for the researcher to gain skills as a moderator, and to modify procedures and a sequence of fifteen open-ended questions developed by Eddy (1997). Modifications were made following each test.

On September 12, 1997, a pilot test was conducted with a group of three female staff members from Virginia Tech. The pilot test was conducted in a conference room in Wallace Hall. The primary researcher's graduate committee met after this test to discuss results and suggest revisions. Focus group methods and procedures were revised, and the questions were modified to make them more appropriate for middle age women and to elicit information regarding dairy food choices, perceptions of dairy foods, and perceptions of health. Revisions were made prior to the second pilot test. A second pilot test was conducted on October 24, 1997 with a group of six middle age women in Tazewell, Virginia, in the living room of one of the participants' home.

The researcher served as the moderator of both of the pilot test groups. Each discussion began with an introduction of the topic and ground rules for the group discussion as outlined by Krueger (1994) (Appendix B). Audiocassette recorders were used to record the dialogue of each pilot test with the participants' consent. An assistant moderator was present at each test to take detailed notes of participants' responses, observe group interactions, and assist with activities.

Each pilot test lasted approximately 45 minutes to 1 hour.

A checklist, *How Much Dairy Did You Have Yesterday?*, was administered to each participant after the closing question of each pilot test (checklist included in moderator's guide, Appendix C). The checklist was used to obtain information about dairy food consumption and dairy food choices. A sociodemographic questionnaire (Appendix D) regarding age, education level, living arrangements, employment status, meal preparation, food purchasing practices, and frequency of eating out was administered following the checklist. The assistant moderator helped administer the checklist and sociodemographic questionnaire.

Results from the pilot tests indicated that the terminology in an activity used by Eddy (1997) in which participants ranked factors that influenced food choices needed to be revised. The terms "easy to use", "good for me", and "low cost" were changed to "convenience", "healthy", and "economical". In some cases, probes for focus group questions were modified because the probes used by Eddy (1997) were ineffective in eliciting the desired information. Final questions that were used in the focus groups are included in the moderator's guide (Appendix C). Picture illustrations of common serving sizes were added to the checklist, *How Much Dairy Did You Have Yesterday?*, to assist women in visualizing serving sizes included on the checklist. Minor modifications were also made in the wording of the sociodemographic questionnaire presented in Appendix D.

Recruitment of Focus Group Participants

Focus groups were conducted in rural and urban areas of Virginia. Groups were conducted in towns or cities that represented an area of Virginia, such as eastern region and southwest region. Focus groups were conducted in these areas because the researcher desired qualitative data that represented the opinions and perceptions of women in different areas of Virginia.

Participants recruited for the focus groups were non-Hispanic white women primarily between the ages of 35 and 50 and living in Virginia. The women were non-pregnant and non-lactating, with the exception that one participant in the Dublin group was pregnant. The women were all independently living and responsible for most of the food purchasing and meal preparation of the household. All women had at least a high school education. Women were recruited from community groups, such as church groups.

Recruitment of participants was done in cooperation with personal contacts in the various community groups. The researcher made the initial contact at two of the sites (Fredericksburg and Herndon). The initial contact was made by a third party participant, who was a member of the specific group or organization, at the other two sites (Dublin and Harrisonburg). The researcher arranged focus group session dates and explained participant criteria to each contact. Focus groups were conducted in Fredericksburg, Dublin, Harrisonburg, and Herndon between the months of February and April 1998. A chronological plan as suggested by Krueger was followed (Appendix E). The first group took place February 11, 1998, in Fredericksburg at the home of

one of the participants. This group included 4 non-Hispanic white females and represented an urban area in the eastern Virginia region. In Fredericksburg, women were recruited through personal contacts. The second group was held March 3, 1998, at the Dublin Baptist Church in Dublin and consisted of 21 non-Hispanic white females and represented a rural area in the southwest Virginia region. In Dublin, the group was conducted with the Mission Minded Women's Group at Dublin Baptist Church. The third group was conducted on March 19, 1998, at the Rockingham Cooperative Extension Office in Harrisonburg and consisted of 8 non-Hispanic white females and represented a rural area in the central Virginia region. In Harrisonburg, an Extension agent was contacted to determine the appropriate method for recruitment. The Extension agent made the initial contact, which was then followed up by a telephone call from the researcher. Interested participants received letters one week prior to the scheduled focus group reminding them and thanking them for their interest (Appendix F). The fourth and final group was conducted April 30, 1998, in Herndon at one of the participants' home. This group consisted of 6 non-Hispanic white females and represented an urban area in the northern Virginia region. Women were recruited in Herndon through personal contacts.

Focus Group Procedures

Focus group procedures followed methods developed during pilot testing. The principle investigator served as moderator of all focus groups. An assistant moderator, who was a graduate student in the Department of Human Nutrition, Foods and Exercise at Virginia Tech, was present in all focus group discussions to obtain informed consent from each participant, take notes, draw a seating chart, observe group interactions, and operate audiocassette recorders.

Sessions began with a welcome, a statement of purpose, and brief overview of ground rules (Appendix B). Welcome and ground rules were modeled after those described by Krueger (1994) and used by Eddy (1997). Audiocassette recorders then were turned on and participants were asked to introduce themselves individually and state their favorite restaurant or place to eat. The assistant moderator generated a seating chart of the participants to assist in later analysis, but no names of participants were used. The questions and probes developed during pilot testing were asked (Appendix C). The basic line of questioning is shown in Table 3.1.

Two written activities accompanying questions one and seventeen and one verbal activity accompanying question two were included in the questioning line to encourage participation. Written activities were given to the women and directions were read aloud for clarity. The first written activity was designed to get participants thinking about factors that influenced their general food choices. Women ranked four factors (convenience, healthy, economical, and tastes good) in order of importance. Women then shared their choices and rationale for their choices. The participants then were asked to generate a list of dairy foods. The assistant moderator recorded the foods mentioned on a large sheet of poster paper to serve as a reference for the participants throughout the group discussion. This was done because Eddy (1997) found a need to generate a list of dairy foods to focus participants, help clarify foods that constitute dairy foods, and to familiarize participants with speaking in a focus group setting. Non-dairy items suggested by participants (mayonnaise and eggs for example) were not used. The researcher

prior to the study (see Appendix G) compiled a basic list of common dairy foods. When participants did not include some of these important dairy foods, foods were suggested by the principle

Table 3.1- Basic line of questioning used in focus group discussions^a

1. ACTIVITY- FACTORS THAT INFLUENCE GENERAL FOOD CHOICES
 2. ACTIVITY- LISTING OF DAIRY FOODS
 3. Think back over the last few months. What are some dairy foods that you consumed regularly?
 4. Let's talk now about some of the dairy foods you seldom or never eat. As you did before, give some examples and reasons that influence your decision not to eat these foods?
 5. Tell me about dairy foods you order at a restaurant and what influences you to choose these dairy foods.
 6. What are some of the benefits of dairy foods?
 7. What are some of the disadvantages of dairy foods?
 8. Think about dairy foods you ate as a child, adult, and when you were pregnant or breastfeeding. What were some of the changes you made in your food choices?
 9. Describe some situations as you age that may influence you to change the dairy foods you regularly eat.
 10. How do you think the food industry could improve dairy foods to make them more desirable to you and your family or friends?
 11. What could the food industry do to improve dairy foods in restaurants?
 12. We've talked about suggestions to improve existing products. Are there any suggestions for a totally new product?
 13. What does the term osteoporosis mean to you?
 14. Do you think you are at risk for developing osteoporosis?
 15. If you take calcium supplements, what do you see as some benefits of the calcium supplements?
 16. Can you think of some of the dairy advertisements. Tell me about them and what the advertisements say to you. Does the advertisement influence you?
 17. CLOSING ACTIVITY: HOW MUCH DAIRY DID YOU EAT YESTERDAY?
 18. Is there anything else you'd like to add that we have not discussed?
-

^aA more thorough description of questions and probes is provided in Appendix C

investigator and placed on the list following participants' approval. The third activity, *How Much Dairy Did You Have Yesterday?*, was a checklist that accompanied the seventeenth focus group question (Appendix C). This checklist was developed from modifications of an ADA checklist (Pierre, 1997) and a Calcium Checklist developed by Hertzler (1995). Common dairy foods such as milk, cheese, and ice cream were included on the checklist. Subjects indicated number of servings of each dairy food on the checklist they had consumed the previous day. This activity was designed to get an indication of the types and number of servings of dairy foods that the women consumed on the previous day.

The focus group sessions were informal to encourage open participation, and participants were addressed by first names and allowed to speak at any time during the session. The sessions lasted approximately 45 minutes to 1 hour and 30 minutes. After each focus group was completed, participants were asked to fill out a questionnaire on demographic characteristics (Appendix D). Participants were thanked for their participation at the time of the focus group. Thank you notes were sent only to the contacts at all focus group sites.

The moderator and assistant moderator convened after each focus group for a debriefing session. Observations of nonverbal behavior, emerging themes, initial impressions and suggestions for improvements were discussed during debriefing sessions. Tapes were also spot checked to be certain that participants' responses had been captured. The researcher then wrote field notes to identify pertinent information and to use later in a more thorough analysis of data.

Analysis of Focus Group Data

The researcher analyzed data generated from the four focus group discussions according to procedures described by Krueger (1994) and Knodel (1993). The researcher listened to each tape to become reacquainted with the flow of dialogue prior to the start of transcription. Written transcriptions were produced using a word processing program while listening to the audiocassette tapes. Participants' responses were transcribed verbatim from the audio recordings. An undergraduate student in the Department of Human Nutrition, Foods and Exercise at Virginia Tech listened to the tapes and reviewed the transcripts for accuracy. Transcripts were coded with the initials for the focus group sites: F (Fredericksburg), D (Dublin), H (Harrisonburg), and He (Herndon). Participants' responses were coded with numbers corresponding to the number of the response related to each specific focus group question. Eddy (1997) used similar procedures for transcribing audiocassette recordings from focus group discussions with older women.

Initial themes were generated, as described by Knodel (1993), and used as codes in the initial stages of analyzing the qualitative data in the transcripts. Codes were developed based on study objectives and themes identified by Eddy (1997) in a study of older women's perceptions of dairy foods. Transcripts, notes from the focus groups and summaries developed in the debriefing sessions were used to help identify initial themes. A word processing program was used to cut and paste responses from each transcript into the coding categories. Each response

was accompanied by the initials identifying the focus group site and a number designating the response within the group of responses for each focus group question. This allowed the researchers to refer back to the response in the context in which it originally occurred. As analysis progressed, initial themes were refined and broken down into subthemes where necessary (Knodel, 1993; Krueger, 1994). Only the moderator conducted this systematic analysis. After completing the analysis, the primary researcher and research advisor met to discuss themes and results to minimize bias in data analysis. The final codes represented the themes and subthemes used in reporting the results. These themes and subthemes are reported in Table 3.2. Themes were grouped according to two major categories which included, (1) perceptions of nutrition and health that influenced dairy food choices and (2) factors that influenced dairy food choices.

Data from the checklist were analyzed in two ways. First, the servings of dairy consumed by each woman were calculated to determine those women that were consuming the recommended number of servings of dairy foods on the previous day. The checklist was used as an indicator of dairy foods consumed most often by women. Second, the number of servings of each dairy food at each site and total servings of each dairy food was calculated. Number of women at each site who responded to the various items on the sociodemographic questionnaire was also calculated.

Reporting of Results

A description of focus group participants is provided in Chapter IV. Included in that chapter are the sociodemographic characteristics, group dynamics, and information from the checklist, *How Much Dairy Did You Have Yesterday?*. The demographic data from the questionnaires were compiled for each group individually and the group as a whole (Chapter IV, Table 4.1). Focus group themes are reported and discussed in Chapters V and VI. Two chapters were used to report results because themes were divided into two major categories. Themes and subthemes related to perceptions of nutrition and health that influenced dairy food choices are discussed in Chapter V, and themes and subthemes related to factors that influenced dairy food choices are discussed in Chapter VI. The interpretative summary method described by Krueger (1994) and used by Eddy (1997) was used to report focus group themes and subthemes. With this method, themes are explained or interpreted and a descriptive summary of each theme is given and followed by illustrative quotations to help explain the theme. Adjective phrases, such as “several participants thought...” or “...was a prevalent thought”, were used as suggested by Krueger (1994). Illustrative quotations used to explain the theme were chosen because they were representative of responses made by the women and they represented themes among the groups. Illustrative quotations used to report results were also chosen because they gave an explanation for the comment. Women frequently interrupted one another or more than one participant spoke at a time as a result some quotes were not complete sentences or complete thoughts. When the symbol “...” appears in an illustrative quotation this indicates were another participant interjected a comment. The results were reported collectively. Individual focus groups results were not reported because researchers were interested in overall attitudes and perceptions of middle age women. Conclusions for the study are discussed in Chapter VII.

Table 3.2- Focus group themes and subthemes grouped into two broad theme categories

Perceptions of Nutrition and Health That Influenced Dairy Food Choices

Attitudes about health

Advantages and disadvantages of dairy foods components

Fat

Calcium

Vitamins

Other food components

Health conditions perceived to be related to dairy foods

Osteoporosis

Lactose intolerance

Kidney stones

Other health conditions

Vitamin and mineral supplementation

Factors That Influenced Dairy Food Choices

Preference for dairy foods

Product characteristics

Taste and sensory attributes

Perceived healthfulness of product

Convenience and preparation time of product

Monetary issues

Availability of products

Packaging issues

Other product characteristics

External influences

Family

Media

Physicians

CHAPTER IV

RESULTS AND DISCUSSION:

SOCIODEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS AND FOCUS GROUP DYNAMICS

Introduction

The objectives of the study were to understand the perceptions and motivations of educated, non-Hispanic white women, 35 to 50 years of age, relating to dairy food consumption. Sociodemographic characteristics, group dynamics, and results of the closing activity, *How Much Dairy Did You Eat Yesterday?*, are presented in this chapter to provide a description of focus group participants and introduce focus group themes.

Sociodemographic Characteristics of Participants

Sociodemographic characteristics of the women indicate that the focus group participants were representative of the target population. Results of the demographic questionnaire are presented in Table 4.1. A total of 39 females participated in the four focus groups. The majority (59%) of participants were between the ages of 35 and 50 years. Seven participants were less than 35 years of age and ten participants were over 50 years of age. One participant did not indicate age.

All women in the focus groups had at least a high school diploma. Light (1988) reported that almost 90% of Baby Boomers received a high school degree. In this study, 100% of the participants had completed a minimum of high school, which is higher than the percentage reported by Light (1988). Light (1988) also reported that 22% of Baby Boomers had graduated from college. The majority (77%) of women in the study had received formal education above a high school degree. Twenty-six percent of the women had an undergraduate degree, and 8% had a graduate degree. Education level is important in food choices and design of nutrition education programs. Senauer et al. (1991) reported that educated individuals tend to be more adventuresome in their food choices and adopt new foods in their diet more quickly.

The majority (97%) of women in this study lived with others. Only one woman lived alone. Of those living with others, 92% lived with a spouse, and 55% had children living at home. Easterlin et al. (1990) reported that a Baby Boomer parent was more likely to be divorced, and the family of a Baby Boomer was more likely to be headed by a single parent. The participants were not asked to disclose their past or present marital status in the demographic questionnaire because this was believed to be a sensitive issue.

In this study, 87% of women (34 of the 39) were employed. Of those women employed, 24% were employed part-time and 76% were employed full-time, which is similar to the average reported by Russell (1993) for middle aged women. Light (1988) reported women in the Baby

Table 4.1- Sociodemographic characteristics of focus group participants^a

Characteristic Total	Focus Group Sites				
	F'burg	Dublin ^b	H'burg	Herndon	
Age					
≤35	1	6	0	0	7
36-40	0	5	0	1	6
41-45	1	1	4	1	7
46-50	0	4	1	3	8
51+	2	4	3	1	10
No Answer	0	1	0	0	1
Highest level of education					
High school diploma	2	4	2	1	9
Vocational/technical school	0	2	0	0	2
Associate degree	1	6	0	0	7
Some college	1	3	3	0	7
B.S or B.A.	0	3	3	4	10
Graduate degree	0	2	0	1	3
No answer	0	1	0	0	1
Live alone					
Yes	0	0	1	0	1
No	4	21	7	6	38
Spouse	4	18	7	6	35
Children	3	10	3	5	21

continued

Table 4.1- (continued)

Characteristic	Focus Group Sites					Total
	F'burg	Dublin	H'burg	Herndon		
Work						
No	1	4	0	0		5
Yes	3	17	8	6		34
Part-time	2	1	1	4		8
Full-time	1	16	7	2		26
Grocery shopping for household						
Never	0	0	0	0		0
Sometimes	0	2	0	0		2
Almost always	2	9	4	2		17
Always		2	10	4	4	
20						
Prepare household meals						
Never	0	1	0	0		1
Sometimes	0	3	0	2		5
Almost Always	2	14	6	3		25
Always		2	4	1	1	
8						
Eat out						
Never	0	0	0	0		0
<1 meal per week	2	1	1	1		5
1 meal per week	1	5	2	1		9
>1 meal per week	1	15	5	4		25

continued

Table 4.1- (continued)

Characteristic	Focus Group Sites					Total
	F'burg	Dublin	H'burg	Herndon		
Follow diet						
No	3	5	5	1	14	
Yes	1	16	3	5	25	
Low-fat	0	13	3	5	21	
Low cholesterol	0	6	0	5	11	
Low salt	1	3	2	2	8	
Low calorie	0	7	0	4	11	
Diabetic	0	1	0	0	1	
Vegetarian						
Yes	0	0	1	0	1	
No	4	21	7	6	38	
Take vitamin/mineral supplements						
Yes	4	13	7	6	30	
No	0	8	1	0	9	

^an=39 participants

^bOne participant at site was pregnant

Boomer generation tend to be very career oriented, and in most cases the women work outside the home. As a result women are often stretched between dual careers, at work and home. Of the women in the work force, approximately 75% are employed full-time (Russell, 1993). Results of the 1985 CSFII indicated that women 19-54 years of age and employed full-time tend to have lower average intakes of milk, cereal, and pasta.

Traditionally women have been responsible for purchasing and preparing food. The majority of women who participated in this study purchased and prepared foods for the households. Forty-four percent reported that they “almost always” purchased food and 51% reported that they “always” purchased food. The majority of women also reported that they “almost always” (64%) or “always” (20%) prepared meals for the household.

The majority (64%) of women in the study reported eating out more than one meal per week, which is similar to findings of national surveys. Studies have found that women employed full-time consume more meals away from home than those not employed full-time. It has been estimated that 75% of middle age women eat out an average of once every three days. Studies indicate that women who eat at fast food restaurants tend to have lower average intakes of calcium, fiber, folate, vitamin A, and vitamin C (Krummel and Kris-Etherton, 1996).

Chernoff (1995) reported that Baby Boomers tend to have better health practices, which include healthier diets and a greater awareness of preventive health than their parents. The majority (64%) of women in this study reported following a diet, and most indicated that they followed one or more dietary restrictions. The one woman who followed a diabetic diet and one of the eleven who followed a low cholesterol diet indicated the diets were prescribed by physicians for health reasons, while other women, such as the 11 following a low calorie or weight loss diet, indicated dietary restrictions were self-prescribed. Most women who reported following a specific diet restricted a combination of things, such as fat, cholesterol, and calories. Fifty-four percent of women in this study reported consuming a low-fat diet, which is similar to another study which indicated at least 45% of the women consumed a low fat diet for health reasons (Anonymous, July/August 1997). It is estimated that 4% of American women follow some form of vegetarian diet. In this study, only one woman reported following a vegetarian diet.

Thirty (77%) of the women in this study reported taking a vitamin and/or mineral supplement on a daily basis. Of those women taking vitamin and/or mineral supplements, 50% reported taking a multi-vitamin, 37% reported taking calcium, and 30% reported taking vitamin E. Many of the women reported taking a combination of supplements such as calcium and vitamin E. Other vitamin and/or mineral supplements women in this study reported taking were vitamin C, combination of B vitamins, vitamin A, and chromium. One woman reported taking a vitamin/mineral supplement but did not specify type of supplement. Other studies indicate that vitamin and mineral supplements are one of the leading non-prescription pharmaceuticals consumed on a regular basis in the U.S., and women of all ages are more likely to consume supplements than men (Koplan et al., 1986; Krummel and Kris-Etherton, 1996).

Listing Dairy Foods

Women were asked to make a list of dairy foods at the beginning of the focus group. The assistant moderator recorded these foods on a large sheet of poster paper. This activity was designed to focus the participants on dairy foods and to help clarify foods considered to be dairy foods. The list of dairy foods generated by the women served as a reference throughout the group discussion. This helped the women to consider a broad range of dairy foods and prevented the women from focusing on one particular dairy item.

This activity was effective in identifying foods the women considered to be dairy. Milk, cheese, and yogurt were mentioned first in all groups indicating that these foods are readily recognized as dairy foods. The women frequently named a variety of cheeses, such as American, cheddar, Brie, and Swiss. The women also elaborated on types of milk, such as evaporated, condensed, whole, 2%, and skim. The women at times indicated which type of milk they preferred. The women also mentioned foods that contain a significant amount of dairy foods, such as lasagna, pizza, and macaroni and cheese. The activity was also effective in identifying some misconceptions about dairy foods, such as eggs and mayonnaise being a dairy food. Eggs were mentioned in all groups, while mayonnaise was only mentioned in two of the groups. Women in all groups indicated that eggs were considered to be dairy foods because they are frequently located in the dairy food case in the grocery store; “*Well they’re (eggs) in the dairy department in the grocery store*”. Not all women in the groups held the misconception that eggs were dairy foods as they corrected each other when eggs were mentioned; “*eggs are not dairy*”. Lists from all focus groups were similar; women frequently listed dairy foods such as milk, cheese, and ice cream.

Dairy Food Consumption and Choices of Focus Group Participants

Results from NHANES III and the 1987-88 NFCS indicated middle age women had an inadequate intake of dairy foods; however, women included in NHANES III and the 1987-88 NFCS were of mixed socioeconomic status. It was speculated that women at a higher socioeconomic level may consume more dairy foods. Eddy (1997) speculated that a dairy food consumption survey might have been beneficial in understanding dairy food intake in a study of older women’s perceptions of dairy foods. For this reason a checklist of dairy food items was included as an activity in this study.

The checklist, *How Much Dairy Did You Eat Yesterday?*, a checklist modified from examples found in *Calcium in Your Life: Up-to-Date Tips from the World’s Foremost Nutrition Experts* (Pierre, 1997) and *Calcium Checklist-Food Guide Pyramid* (Hetzler, 1995), consisted of 13 food items that count as one serving of dairy. Results of the checklist, which indicate dairy foods women consumed on the previous day, are presented in Table 4.2. Although, results indicate dairy foods women consumed the previous day, the results may not indicate typical dairy food intake. Also, the checklist was completed at the end of the discussion; therefore, results might be biased. Results indicate that 59% of the participants were not consuming the recommended number of servings of dairy foods per day. The recommended number of servings

Table 4.2-Number^a of participants in focus groups meeting and not meeting recommended number of servings of dairy products as determined with the checklist *How Much Dairy Did You Eat Yesterday?*^b

Number of Servings	Focus Group Sites				Total
	F'burg	Dublin	H'burg	Herndon	
≤1	1	8	1	3	13
2	1	7	1	1	10
3	0	3	5	2	10
≥4	2	3	1	0	6
Total	4	21	8	6	39

^an=39 participants

^bChecklist modified from examples found in *Calcium in Your Life: Up-to-Date Tips from the World's Foremost Nutrition Experts* and *Calcium Checklist- Food Guide Pyramid*

of dairy products to meet calcium needs is 2-3 per day for adults, with 3 recommended for women by some health experts (USDA, 1994). The 1994 Review of Healthy People 2000 indicates that the percentage of women 25 to 50 consuming two or more servings of calcium rich foods per day was 16% (U.S. Dept. of Health and Human Services, 1994). Forty percent of women in this study consumed 3 or more servings of dairy products which suggests that the women in this study represented a segment of the population who had a greater intake of dairy products than the average female population; however, 13 of the 39 women were consuming ≤ 1 serving per day. The portion of women consuming less than the recommended number of servings of dairy foods was greater in the Dublin and Herndon groups (Table 4.2). The number of women consuming adequate servings of dairy was evenly divided (2 meeting and 2 not meeting recommendation) in the Fredericksburg group (Table 4.2). In the Harrisonburg group, a larger portion of women were meeting the recommended number of servings of dairy (Table 4.2).

Dairy foods consumed by women in this study can be identified from results presented in Table 4.3. Contained in the table are the numbers of women who consumed specific food items that are equivalent to one serving of dairy. Results indicate that milk and cheese, in various forms such as sliced, grated, and pizza, were consumed by most of the women. Nineteen women reported having at least one serving of milk the previous day, and 20 women reported having some form of cheese the day before the group discussion. Results from national surveys indicate fluid milk consumption increased in 1995 after a two-decade decline in consumption (Anonymous, February 1996). The specific type of milk consumed (i.e. whole, 2%, skim, etc.) was not indicated on the questionnaire, but reports indicate that lower fat milk is the most commonly consumed type of beverage milk (Zizza and Gerrior, 1995). Senauer et al. (1991) reported that cheese consumption accounts for an estimated 17% of all dairy food consumption, and it is the largest provider of dietary calcium. Increased consumption of pizza is a major factor in increased cheese consumption (Senauer et al., 1991). Yogurt (regular and frozen) and ice cream were the second most frequently consumed dairy foods (Table 4.3). It has been estimated that 98% of all American households consume some ice cream, and ice cream consumption tends to be greater in more educated individuals and in households with higher income (Senauer et al., 1991). Cross et al. (1994) found that ice cream was the second most popular evening snack among older adults. Results from surveys indicate that yogurt consumption has increased almost threefold since the 1970's, while cottage cheese consumption has steadily declined (Putnam and Duewer, 1995). Pudding was consumed by 7 of the women, while only one focus group participant consumed cottage cheese.

Women at the Dublin, Harrisonburg, and Herndon sites reported consuming a greater variety of dairy food items than did the women in the Fredericksburg site (Table 4.3). Women in the Fredericksburg group reported consuming milk, yogurt, and cheese the previous day. Women from the other three groups (Dublin, Harrisonburg, and Herndon) also reported consuming other dairy foods such as frozen yogurt, ice cream, pudding, cheese pizza, cheeseburger, and cottage cheese. This may be due to the larger group sizes (Table 4.1).

Table 4.3- Number^a of participants consuming dairy products included in the checklist *How Much Dairy Did You Eat Yesterday?*

Dairy Foods ^b	Focus Group Sites				Total
	F'burg (n=4)	Dublin (n=21)	H'burg (n=8)	Herndon (n=6)	
8oz fluid milk	3	9	6	1	19
8oz yogurt	1	1	2	2	6
½ cup ricotta cheese	0	0	1	0	1
10oz milkshake	0	0	0	0	0
2 slices processed cheese	3	2	4	0	9
1oz hard cheese	1	3	0	1	5
1/3 cup grated cheese	2	2	0	2	6
1 cup frozen yogurt	0	2	0	0	2
1 cup cottage cheese	0	1	0	0	1
½ cup softserve vanilla ice cream	0	4	3	1	8
½ cup pudding	0	5	1	1	7
1 slice medium cheese pizza	0	3	1	1	5
1 medium cheeseburger	0	1	1	0	2

^an=39 participants

^bEach food item is equivalent to one serving of dairy

Focus Group Dynamics

Focus group dynamics are reported here because when interpreting focus group responses the context in which comments occur must be considered. The characteristics of the participants' and focus group dynamics, such as group size, relationships within the group, and interactions among the women in the groups, influence responses provided by participants to focus group questions (Krueger, 1994).

Fredericksburg Focus Group

Four women participated in the Fredericksburg group, which was held at one of the participants' homes. The focus group was conducted in the living room that had two open doorways that remained open during the group discussion. There were distractions at times with noise from other areas of the house, and one of the participants' daughters came into the room to speak to her mother. The women, the moderator, and assistant moderator sat around the room in various chairs and couches. The women participating in the group remained focused on the group discussion despite the minor distractions.

Women in the group enjoyed eating out, especially at steak and seafood restaurants and Chinese restaurants. Most women in the group appeared to be acquaintances. Two of the women were beauty consultants for the same company and spoke openly about each other's preferences. Three of the women in the group discussed their opinions openly, but one participant required direct questions to encourage her participation at the beginning of the group discussion. However she became more talkative as the discussion progressed. The participant responsible for recruiting the other participants later stated to the moderator that the woman who was less vocal had a low self-esteem. The small size of the group allowed open discussion without confusion. This group brought up additional topics such as menopause at the beginning of the group; however, it was easy to direct them back to the topic of dairy foods. At the conclusion of the focus group discussion, one of the participants requested that the results of the study be sent to her; this interest in the study may have contributed to her willingness to be a participant.

Dublin Focus Group

Twenty-one women participated in the Dublin focus group. The setting for the Dublin focus group was a Sunday school classroom at the Dublin Baptist Church. The focus group discussion was conducted at the beginning of the meeting of the Mission Minded Women's group. Participants' and the assistant moderator sat in chairs placed in a circle around the room. The room was small and participants were seated close together. The moderator stood throughout the discussion, as there were no chairs or space for additional chairs. The presence of the moderator standing at the front of the room may have provided an atmosphere of being at a lecture rather than a group discussion as this group required the use of probes to stimulate discussion. Probes were used frequently with this group to obtain responses. The poster board used for the listing activity was placed in the doorway and was not easily visible to all participants. This was the only focus group where one of the audiocassette recorders malfunctioned; however, the second audiocassette recorder functioned properly throughout the

discussion, so participants' comments were captured.

All of the participants were acquaintances because of their participation in the Mission Minded Women's Group at Dublin Baptist Church. Women in this group also enjoyed eating out and specified homestyle restaurants and steak houses frequently. This was the largest focus group with 21 participants. Unfortunately due to the size of the group small conversations occurred outside the group discussion; however, most of the women participated openly. None of the participants dominated the conversation. Some participants were less talkative; however, they made appropriate comments when they contributed to the group discussion. At times individuals had to be addressed individually due to the size of the group. The discussion at this site was not as in depth as the discussion at the other sites; however, major themes were evident. This was most likely due to the size of the group. Toward the end of the focus group discussion women began to get restless and more small conversations outside the group discussion occurred.

This was the only group to request the results of the study as well as additional information on osteoporosis and hormone replacement therapy. The participants' interest in additional information indicates interest in the topic and may have been one of the reasons for the large size of the group.

Harrisonburg Focus Group

The Harrisonburg focus group was held at the Rockingham County Extension office. The focus group was conducted in a conference room. The group was held in the evening, so there were no distractions as the focus group participants, moderator, and assistant moderator were the only people in the office. The moderator and participants sat at a rectangular table during the discussion, and the assistant moderator sat outside the group so she could take notes and observe group interactions without disrupting the group. The list of dairy foods generated during the focus group discussion was posted on the wall of the conference room, where it was visible to all participants.

When asked about favorite restaurants, many of the women named the Bluestone, a fine dining restaurant located in Rockingham County. The eight women who participated in the group were all members of a volunteer group with Virginia Cooperative Extension located in Rockingham County, as a result all of the women were acquaintances. Knowing each other on a professional level did not hinder open discussion as the women openly expressed differing opinions. Women were willing to share opinions and ideas, but required more probing than the other groups to obtain desired information. More probing was necessary as the women tended to ask more questions to clarify questions. Also, the women asked the moderator to answer questions, which the moderator acknowledged and answered after the focus group was completed. All women actively participated in the group discussion; however, when discussing osteoporosis two women who were menopausal dominated the conversation. During the discussion of supplements, another participant dominated the conversation by describing numerous supplements she consumed and encouraging others to visit health food stores, such as General Nutrition Center (GNC). During discussion of eating habits, one participant seemed reluctant to participate in the discussion, and this may have been due to the fact that she was

overweight.

Women from this group also requested results from this study. This was the only group where women asked specific questions about menopause, osteoporosis, and calcium supplementation after the completion of the discussion. Women frequently took notes during the question and answer period following the group discussion. Their interest in osteoporosis and calcium supplementation may have contributed to their willingness to participate in the focus group.

Herndon Focus Group

Six women participated in the Herndon focus group, which was held at the home of one of the participants and was conducted in the living room. The living room was open to the kitchen and the upstairs. The openness of the room created poor acoustics, so the focus group tapes were unclear at points. The environment was distracting at times from noise from other household members, the telephone ringing, and a clock in the hall chiming every quarter hour. Women sat on couches and chairs arranged in a circular formation around the room.

When discussing favorite restaurants, commonly mentioned types of restaurants were steak houses and Italian restaurants; however, one participant stated any restaurant without a television was her favorite. The women appeared to be acquainted through activities their children were involved in at school, but did not appear to be close friends. All of the women actively participated in the group. At times, more than one participant would talk at the same time creating some confusion. Although only 6 women were in the group, the women frequently held small conversations to share opinions and ideas outside the group discussion. The women frequently discussed non-dairy foods and additional topics that were not relevant to the discussion of dairy foods. The discussions of non-dairy foods were prompted by where to purchase certain food items and changes in dairy food consumption across the lifecycle. Mention of children also frequently led to discussions not related to dairy foods. The moderator had to frequently direct the women back to the discussion of dairy foods. At the conclusion of the group, most women left promptly because of other commitments, such as picking up children from school events. This was the only group that did not request a copy of the study results or additional information.

CHAPTER V

RESULTS AND DISCUSSION:

PERCEPTIONS OF NUTRITION AND HEALTH THAT INFLUENCED DAIRY FOOD CHOICES

Introduction

One objective of this study was to determine middle-aged women's perceptions of dairy foods. This is important because of the major role calcium containing foods, especially dairy foods, play in preventing chronic disease such as osteoporosis. Focus group themes and subthemes (Table 3.2) related to perceptions of dairy foods and their relationship to health are discussed in this chapter. Attitudes about health and the perceived role of dairy foods in health were motivating factors in dairy food choices. Vitamin and mineral supplementation also is discussed in this chapter. Supplementation of the diet with vitamins and minerals was widespread in this sample of women and was associated with a variety of health issues, including menopause and osteoporosis.

Attitudes About Health

Chernoff (1995) reported that overall Baby Boomers have better health practices, which include healthier diets and a greater awareness of preventive health, than their parents. A 1996 survey of consumer trends in the U.S. indicated greater than 78% of consumers, 40 to 49 years of age, chose foods for health reasons the majority of the time (Food Marketing Institute, 1997).

During the activity in which women discussed factors that influenced their food choices, many of the women who participated in the focus groups indicated purchasing foods or changing dietary habits for health reasons. This was demonstrated in responses such as: "*Okay, I'm next and I chose healthy as my first choice because I am really sensitive to a lot of foods, so I don't eat much fat. I watch the additives, and I try to do the high fiber stuff.*"; "*I put one healthy because everybody in our family has had a heart attack, and I'm next in line they say.*"; and

I don't have any choice, but to change my diet. I really soon got to get on it because my cholesterol is sky high, and this is the second time it's been this high. And it's mainly because I don't exercise and eat all the wrong things like El Puerto (local Mexican restaurant), so I, as I, if I live, if I live very long I'm going to have to change my diet.

The majority of women in this study reported that they followed a specific diet (Table 4.1). Most of the diets were self-prescribed, but two of the women indicated that their diets were prescribed by a physician. Prevalent diets mentioned were low fat, low cholesterol, and low calorie or calorie reduced for weight loss. Many of the women reported following a diet that was a combination of two or more restrictions such as a low fat and low cholesterol diet. The majority of women following a diet explained that the diet was low fat. This was illustrated by

quotes such as “*We’re all trying to watch fat grams.*”; and “*I try to watch the fats.*” A survey, Trends in the United States: Consumer Attitudes and the Supermarket, conducted annually by the Food Marketing Institute (FMI), found that at least 45% of the women in the survey maintained a low fat diet for health reasons (Food Marketing Institute, 1997). Other diets that the women followed included low salt, diabetic, and vegetarian.

Although women between the ages of 35 and 54 are more receptive to changing dietary habits to be more healthful, studies indicate that less than one third of the women actually make dietary changes to decrease risk of hypertension, heart disease, and osteoporosis (Beatty and Finn, 1995). Responses of focus group participants indicated that dietary changes to be more healthful had not occurred as the following illustrate: “*Number one healthy (most influential in making food choices). I tried to cheat because I’m supposed to be on a diet.*”; “*Of course healthy should be first, but it ain’t. At least we’re honest. Right?*”; and “*The second one I said healthy because I do have good intentions, but I never do get there.*” Some of the participants indicated reasons why they did not consider health first when making food choices. One group member responded “*And healthy is last because it usually doesn’t taste good if it’s healthy*”. Taste was frequently mentioned as a reason health or healthy foods were not chosen. This suggested to the researcher that taste was important to the women’s food choices. This is discussed in detail in Chapter VI.

When asked to list dairy foods, one participant in the Harrisonburg group stated, “*There’s not a thing we’re listing that we should ever put in our mouths*”. This attitude was not typical. This participant indicated that she was very health conscious and took numerous vitamin/mineral supplements and herbal combinations from GNC. Baby Boomer’s interest in health and nutrition influence their perception of dairy foods. Light et al. (1992) reported that dairy foods are generally accepted by consumers at present; however, consumers increasing interest in health and nutrition influenced consumption of some dairy foods, such as whole milk and cheese, because of their association with fat and cholesterol.

Advantages and Disadvantages of Food Components

Women in this study were asked to discuss advantages and disadvantages of dairy foods. The three topics discussed most often were fat, calcium, and vitamins. Though not predominant themes, some other advantages and disadvantages, such as protein, salt, calories, and the cultures found in yogurt, were mentioned in one or more but not all of the groups. Eddy (1997) also found that few educated older women mentioned salt and calories as disadvantages of dairy foods.

Fat

The fat content of dairy foods was a predominant theme throughout the focus groups. Fat was perceived to be both an advantage and disadvantage of dairy foods. Eddy (1997) found fat was a predominant theme of focus groups with educated, older women, but the women did not mention any advantages or the need for fat. Many of the women, in this study, mentioned that

diets lower in fat were healthier; however, they were aware of the need for a certain amount of fat in the diet. The need to lower fat in their general diet, which included dairy foods, was frequently mentioned. The majority (21 of 39 women) of participants followed a low fat diet plan (Table 3). This theme first emerged in the introductory activities and was evident throughout the remainder of the discussions. Women often used low-fat or fat-free products to decrease fat in their diets; however, many of the women did not find these products to be satisfactory. Skim and 2% milks were mentioned as alternatives to whole milk, but some participants mentioned that they still used whole milk.

Fat was perceived to be an advantage of dairy foods in two groups (Fredericksburg and Harrisonburg) as illustrated by the following quotes: “*You need a certain amount of fat.*” and “*That’s one of the, you know when you’re sitting back drinking that milkshake, you get the calcium, you get the fat. I’m getting everything at once*”. Women indicated that fat was an advantage because the body requires a certain amount of fat to function properly. Reduced fat and fat-free products were seen by some women as not being healthy alternatives to full fat products, because of the preservatives and fat replacers used. This is evident in the following quote: “*The low-fat stuff isn’t good for you, so you need to get back to the whole stuff*”. Women also expressed a preference for full fat dairy foods as illustrated in the following: “*Yeah, that’s (Ben and Jerry’s ice cream) good. It’s even more fat.*” Another remarked, “*We only drink whole (milk). If it’s not real then we don’t want it. It’s like those low-fat cheeses, oh forget it!*” Rationalizing the use of full fat foods by using less of the high fat items is illustrated in the following quotes:

Mine (factors that influence food choices) are just like theirs (other group members) with taste first...if it doesn’t taste good then I don’t want it. Also I’m not into the fat-free things. I would have, I would rather have a little real butter than a whole lot of margarine. The calories are about the same and the butter is a little more pure. I’d rather have ice cream than frozen ice milk. I’m sorry, I like the rich taste in my mouth or the rich feel.

But you see the thing is when you buy something like that (Hagen Daas and Ben and Jerry’s ice cream) you really enjoy every spoonful and you don’t eat as much, actually you don’t eat as much. So in the long run you’re better off to buy the most ridiculously, insanely richest thing you can buy and just eat a little bit of it. If you’re going to stick calories in they might as well be really good ones.

Eddy (1997) also found educated older women would rather have less of the “real thing” because they did not like the low-fat or fat-free alternatives.

Women mentioned that they became more concerned with the fat content of food as they got older as illustrated by the following: “*I try to watch fats because I used to could eat anything like I wanted, and then after 50 you start putting on...*”; and “*I was going to say, at my age now I do watch my fats and what I eat more...*”. Emphasis on fat content of foods as undesirable, and relating specifically to dairy foods is seen in the following: “*I never use half-n-half. It’s too fat*”;

“It’s (dairy) fattening”; *“(seldom eat) cream soups because they have a lot of fat”*; and

Now we’re getting older, I don’t eat as much cheese because I think, and I love Cracker Barrel cheese, but every time you think about getting it. I should have eaten the low fat one. You know, I should have eaten the lower fat or part skim, and when you make lasagna, I get the lower fat stuff. It’s not as much fun anymore.

The fat content of dairy foods was also associated with calories as illustrated in the following remarks: *“Lots of calories in dairy foods unless you get the lowfat.”* and *“I eat yogurt regularly because it’s low in fat, and you can get it with Nutra Sweet , so it’s low in calories”*. The following quote indicates that these women felt guilty for consuming high fat dairy foods: *“I think everyone here is guilty of ice cream.”*. Women frequently discussed the low-fat dairy foods they chose, such as reduced-fat sour cream, reduced-fat cream cheese, low-fat ice cream, and skim milk. One woman explained, *“Now I do think about the health in that respect...I don’t make alfredo sauces because of the fat and everything. If I use sour cream, I use the lite and that low-fat cream cheese, I usually buy the Healthy Choice .”* When discussing low-fat foods, women often mentioned ways they lowered fat in the diet. Women provided suggestions such as these to each other: *“I have some cake recipes that call for sour cream, but I use the 1/3 less fat sour cream.”*; *“Try the fat free butter it’s delicious.”*; and *“Oh, I’ll tell you the best is Borden (fat) free cheese that you get from the health food store. I can’t tell the difference.”*

The emphasis on fat could be due to women’s desire to lose weight and their belief that dairy foods have a high fat content. Media promotion of fat reduction as a means of weight loss has increased over the years, and reduced fat products have flooded the market. Focus group participants indicated that when they were children the message of fat and cholesterol was not as prevalent, and they also indicated that they were aware that this message is more prevalent now, as indicated in the following: *“We just didn’t hear about cholesterol when I was a kid and high fats and so on. It just wasn’t discussed that much.”* One woman indicated that she was now afraid to consume certain dairy foods because of the negative media portrayal of fat, *“Butter, churned butter. It was delicious. Now you wouldn’t even dare taste it...paranoid.”*

When asked to discuss changes in dairy foods that had occurred across the lifecycle women indicated that as children they consumed regular fat dairy foods, as illustrated in the following responses: *“(As children) and it was always whole milk. We drank whole milk. All the schools were whole milk.”*; *“We drank milk and it was whole.”*; and *“We ate a lot of ice cream when we were kids. I don’t eat it as much now.”* Many women indicated that they now used skim or other reduced fat milks as illustrated in the following remarks: *“I drink skim.”*; and *“Over the years I’ve bought 2% because I thought I was doing my part. But I didn’t want to go totally skim. Last night I bought 1%.”*

Many studies have been conducted to identify attitudes about fat content of foods. A study conducted with women 25 to 44 years of age indicated that the number one consumer attitude that influenced milk consumption was that milk was a fatty food that causes obesity and

heart disease (Anonymous, February 1996). Putnam and Duewer (1995) reported that the major reason for decreased milk consumption was concern about fat content. The 1989 Prevention Index reported that half of the female participants were concerned about fat and cholesterol in dairy, and these concerns were related to decreased milk consumption (Finn, 1997). Similarly, this study of female Baby Boomers found that women identified fat as a disadvantage of dairy foods. Results from the sociodemographic questionnaire indicate that the majority of women followed a restrictive diet; 44% of those on a diet indicated the diet was low in fat.

The consumption of reduced fat milks has increased over the past three decades (Krummel and Kris-Etherton, 1996). Many of the women in this study reported consuming 2%, 1% or skim milk; however, some women still indicated that they regularly consumed whole milk. Between 1989 and 1991, 57% of women consuming dairy foods indicated consuming reduced fat dairy foods (Krummel and Kris-Etherton, 1996). Many of the participants indicated using reduced fat dairy foods such as reduced fat sour cream, low fat ice cream, and low fat cheeses. Stafleu et al. (1995) reported that middle age and younger women had a low preference for high fat and cholesterol food items. In contrast, Light et al. (1992) found that adults preferred high fat cheese to reduced fat cheese when fat content was known as well as when the fat content was unknown. Similarly, Guinard and Marty (1997) found that women preferred regular fat dairy foods over reduced fat dairy foods; however, the women were more likely to purchase the reduced fat dairy foods. Eddy (1997) found that health perceptions and sensory attributes, especially taste, of food interact to influence dairy food choices of educated older women. Sensory attributes that influenced dairy food choices are discussed in detail in Chapter VI.

Calcium

Women in this study considered calcium to be an advantage of dairy foods. Women specifically mentioned calcium in relation to milk; calcium in relation to other dairy foods was not mentioned in the group discussions, which suggested to the researcher that these women might not be knowledgeable about the calcium content of dairy foods other than milk. When asked to discuss the benefits of dairy foods women responded, “*Calcium*”; “*Also, need it (milk) for calcium.*”; and “*Good calcium.*” Women in the groups agreed by verbally stating agreement or nodding their heads in agreement. Women also associated calcium with strong bones as illustrated in the following quotes; “*Healthy bones and teeth.*” and “*Strong bones and teeth.*” Eddy (1997) found that educated older women associated calcium with strong bones and teeth, too. The women in all groups discussed calcium intake recommendations during the focus group discussion and when completing the checklist. When discussing recommendations, one woman responded, “*How could you possibly take in that much dairy?*” Women perceived calcium to be important in the prevention of osteoporosis, and discussed the use of supplements to increase calcium intake. Osteoporosis and vitamin/mineral supplementation are discussed in depth later in this chapter.

One woman mentioned that there were times during the lifecycle that calcium needs changed, “*...(during pregnancy) high calcium.*” Although many of the women stated that they increased calcium intake, by increasing milk consumption or taking calcium supplements, during pregnancy, they did not understand the need for the additional calcium. One participant

wondered if she had harmed her children by not increasing milk consumption during pregnancy. Other group members assured her that she did not cause harm to her children. One woman felt that increased dairy consumption was not necessary when pregnant, *“Is there really any reason why you’re supposed to drink more milk? I don’t think there really is. I mean as long as your diets got enough calcium in it. Period.”* This was the woman in the Harrisonburg group who advocated taking numerous supplements and encouraged the other participants to purchase supplements from GNC.

Dairy foods are the major source of calcium in the American diet (National Academy of Sciences, 1997). The calcium in dairy foods is more bioavailable and therefore more readily absorbed than that found in vegetables and grains. Parent et al. (1993) found that, in women 50 to 65 years of age, dairy products, such as milk and cheese, contributed approximately 60% of the total calcium intake. Other studies have shown that women receiving adequate calcium in the diet obtain most of the calcium from dairy foods. The USDA’s HNIS indicated that women with children have a significantly higher calcium intake (Behlen, 1986). The influence of external influences, such as family, on women’s dairy food choices are discussed in Chapter VI.

Vitamins

In addition to calcium content, women perceived vitamins to be a benefit of dairy foods. Again women specifically related vitamins to milk and not other dairy foods; this suggested to the researcher that these women were not aware of the vitamin content of other dairy foods. Most of the women were unsure of the specific vitamins found in dairy foods as illustrated in the following quotes: *“I was going to say a vitamin.”*; *“What are the benefits? Do they have a lot of vitamins, some kind of vitamins.”*; *“What are the vitamins?”*; and *“...the vitamins in milk.”* Some women in the groups were more specific about the vitamins, *“...vitamin D especially.”*; and *“Doesn’t it have vitamin A, too? I know vitamin D but...”*. Women also indicated that the vitamins had been added to the dairy foods, as indicated in the following quotes: *“Vitamin D, vitamin A, but those are all added now, you couldn’t get it, it’s all added. It’s not something that’s natural.”* and *“Vitamin D enriched.”* A study conducted with educated older women found that they were also vague on specific vitamins found in milk (Eddy, 1997).

Milk is the primary source of vitamin D in the diet. Studies indicate that intakes of vitamin A and vitamin D are greater when dairy foods are included as a regular part of the diet (Miller et al., 1995b). At present, it is estimated that 98% of milk in the U.S. is fortified with vitamin D (Ziegler and Filer, 1996).

Other Food Components

In addition to fat, other disadvantages of dairy foods were mentioned. The following quotes are representative. When discussing disadvantages of dairy foods, women replied: *“It makes you put on weight.”*; *“Now that’s (cheese) bad for your cholesterol.”*; *“Calories.”*; and *“It’s full of salt, too.”* Light et al. (1992) reported that dairy foods, such as milk, cheese, butter, and ice cream, have been associated with negative health factors, such as calories and cholesterol. These disadvantages were briefly mentioned leading the researcher to believe that they were not perceived to be major disadvantages as fat was. Women in the Harrisonburg group

mentioned dairy products in relation to phlegm production as demonstrated in this response, "...I find that dairy products give me phlegm, especially if I eat ice cream at night before I go to bed and then you wake up in the morning with that hacking and all." Other members of the group mentioned that they had similar problems with dairy foods. One woman thought that phlegm production with dairy food consumption was related to milk allergies, "It's actually a sign that you're a little bit allergic to it."

In addition to the calcium and vitamins A and D, one woman considered protein to be an advantage of dairy foods, and one woman considered dairy foods to be a good energy food and responded, "For energy, I guess." Women in the Dublin and Harrisonburg groups thought the live cultures found in some yogurts were another advantage of dairy foods, as one member stated, "Yeah, you get the nice little cultures...the helpful bacteria."

Health Conditions Perceived to be Related to Dairy Foods

Osteoporosis was discussed in depth in relation to the definition, potential risk, and prevention. Women in this study discussed lactose intolerance and kidney stones when asked about disadvantages of dairy foods. Dairy foods were also negatively related to hiatal hernias and ulcers. Some women however, perceived dairy to be an advantage in that it soothed ulcers. Eddy (1997) found that educated, older women also associated dairy foods with osteoporosis prevention, but negatively linked it to lactose intolerance and kidney stones.

Osteoporosis

Women perceived calcium to play an important role in osteoporosis prevention. Women mentioned that they were concerned with their calcium intake because of the potential risk of developing osteoporosis. This theme was not mentioned in the dairy food discussion, but was discussed when the women were specifically asked what osteoporosis meant to them and their perceived risk of developing osteoporosis. Many of the women indicated that they took calcium supplements for additional calcium. It was clear from the discussions, that the message to increase calcium intake to prevent osteoporosis had reached the women.

When asked what osteoporosis meant to them women indicated that the bones became weaker as illustrated in the following: "weak bones."; "bone deterioration."; "(Bones) full of holes that's what porosis means."; and "brittle bones." Women also associated other negative factors with osteoporosis and made comments such as "that hump" and "...real hard time getting around (if have osteoporosis)."

Women in all groups associated osteoporosis with old age or the aging process, "loss of bone density with age..." and "You start losing it (bone density) right away, it's just as you get older it's more." Although most women associated osteoporosis with old age, one woman responded that calcium is lost throughout the lifecycle and commented, "Estrogen keeps it (calcium loss) down, but even young women are losing a lot of calcium. I mean those of you who have teenage girls they really need to be getting that calcium. It doesn't have to be from milk."

Women associated osteoporosis with menopause as illustrated in the following responses: *“They say you lose 5-8% (of bone mass) the first year after menopause.”*; *“Doesn’t it (osteoporosis) show up after menopause.”*; and *“Well, do you lose a lot of calcium when you go through the change of life?”* One woman indicated that she felt she was at risk for developing osteoporosis because of menopause, *“Well I think another reason I may get it (osteoporosis) also, my period has stopped and I am not taking hormones...and I understand that has a lot to do with it.”* Other women also indicated that they perceived the risk of osteoporosis to increase following menopause because calcium loss from the bones increased with decreased estrogen levels. This belief was demonstrated in quotes such as: *“When the estrogen goes down, the calcium goes out (of the bones) even more.”* and *“Yeah, you’re supposed to take the hormones or you’re going to have terrible things happen to you. What you’re not getting is harmful to your bones especially.”*

Women in all groups felt that osteoporosis was a realistic threat for them, *“All of us are (at risk of developing osteoporosis).”* Women perceived being female placed them at risk for osteoporosis as illustrated by the following responses, *“Just being female makes you at risk (for osteoporosis) I think.”*; *“(Think at risk) me because I’m a woman and I’m 48 years old.”*; and

Women, women, just being women. No really seriously, we had a student a couple of years ago that did this thesis on osteoporosis, and I was kind of like you. I knew what it was, but reading that research I mean after, for really all y’all we’re shedding calcium. We need at least 14-15 hundred milligrams a day of calcium, and it goes up from there. So when you hit fifty, sixty, every one of those it’s like it just starts evaporating.

Another woman in the group responded that women are not the only ones that develop osteoporosis, *“Well you know women aren’t the only ones that suffer osteoporosis.”* Women also mentioned being Caucasian and having small bones increased risk of developing osteoporosis. This belief was demonstrated in quotes about risk of osteoporosis such as: *“Well, I’ve been told, told because of my build that I’m a prime candidate for osteoporosis. So when I think about the word I just sit up (straight). Well, I’ve had doctors tell me because I’m white and thin.”* One woman replied that she did not have to worry about osteoporosis because she was not thin, a fellow group member responded, *“Well, that’s not true because calcium deficiency.”*

Women indicated that they had family members who had osteoporosis. At least one woman from each group commented that she was at risk for osteoporosis because a family member had it as illustrated by the following responses: *“Yes, I do worry about it because I just found out that my mother has it.”*; *“My mother has the start of it...and she has the start of it so I figure it’s hereditary to some degree. So I’m doing whatever I can to prevent it.”*; *“I’m leaning more towards making sure I’m getting more calcium, because my mom’s been diagnosed with osteoporosis, so I want to make sure that my bones are maybe stronger...but I feel like I’m wanting to know more that I can do, so I can prevent it from occurring.”*; and *“...more likely to get it if a close relative like that (mother or aunt) has it.”* Some women commented that they did not feel they were at risk because no family members had osteoporosis. One woman

questioned if not having children decreased the risk of osteoporosis.

Some women indicated that they felt they were at risk for developing osteoporosis specifically because of poor intake of milk. This belief was illustrated in the following quotes: *“I do (think at risk for osteoporosis). I just don’t drink milk at all, so I just assume I’m going to have some problems”* and *“I just figured by not drinking (milk) my whole life and nursing...and not drinking any, any, any milk or anything like that, that I’m really at risk.”* One woman commented that she consumed milk to decrease the risk of osteoporosis, *“Yeah, yeah (I drink) milk for two reasons. One because I like the way it tastes, and two I know about the osteoporosis thing, so my mama is a big drink, my mama is a big milk drinker and she always encouraged me to drink a lot of milk, so I wouldn’t start getting that hump.”* Osteoporosis in relation to dairy foods other than milk was not mentioned. This probably was associated with the fact that women discussed milk in relation to calcium. This suggests that women may perceive milk to be the most nutritious dairy food.

Women associated bone mass with osteoporosis. One woman in the Harrisonburg group commented that she had been cursed with large bones all her life, and encouraged women with small wrists to increase calcium intake now, *“My God, you better start stocking up (on calcium) now.”* One woman in the Dublin group encouraged other women in the group to have a bone scan done to determine bone density,

You can take that bone, everybody probably should take that bone density test. It’s an easy test. All you do is lay on the table and they run a scanner over you. It’s real easy and they tell you your risk and what you should do (another group member interjected “do regular doctors do that (test)?”)...yeah, they have a mobile unit that comes to the doctors’ offices now.

Although women realized the importance of determining bone density, they commented that the bone density test was expensive, *“Now that test is expensive, that one right there (bone density test).”*

Women also commented that exercise was important in the prevention of osteoporosis. This belief is illustrated in the following quotes: *“I think you need to do some weight bearing exercise. I feel like I’ve had enough calcium.”*; *“You have to do the exercise. It’s an important part (of osteoporosis prevention)”*; *“I mean it’s just not taking, you can take all the calcium in the world...if you don’t exercise it’s not going to do any good.”*; and *“Exercise, not just the calcium, but exercise is the key.”*

Osteoporosis affects an estimated 25 million people. The majority (80%) are women over the age of 45 (Finn, 1997). Increased incidence of osteoporosis in women is probably due to their lower initial bone mass and accelerated bone loss following menopause (Miller et al., 1995a). Women in this study commented that they were at increased risk for osteoporosis following menopause due to increased bone loss. Osteoporosis is more prevalent in slender white women (Wardlaw, 1993). Women in this study indicated that they felt being white and thin increased their risk of osteoporosis. Other factors such as smoking, high caffeine intake,

alcohol abuse, lack of exercise, and family history of osteoporosis contribute to the development of osteoporosis (Prestwood et al., 1995). Many women in this study mentioned that family history increased risk of developing osteoporosis, and women realized that exercise was important in the prevention of osteoporosis. Eddy (1997) found that educated older women were aware of the relationship between calcium and osteoporosis. Similarly, women in this study associated calcium with osteoporosis prevention.

Lactose Intolerance

Milk allergies are caused by reactions to the protein present in milk. Lactose is the primary carbohydrate found in milk, and lactase is the enzyme required to break down lactose. Lactose intolerance occurs when there are insufficient levels of lactase. Symptoms frequently identified with lactose intolerance include bloating, flatulence, abdominal distention, abdominal cramps, diarrhea, nausea, and loss of appetite (Hourigan, 1984). Packard and Heaney (1997) report that an estimated 25% to 28% of the U.S. population have intolerance to lactose. Lactose intolerance is reported to be more prevalent in Hispanics, African Americans, Native Americans, and Asians; it is reported that 6-12% of Caucasians in the U.S. are lactose intolerant (Miller et al., 1995a). However, recent research indicates that prevalence of lactose intolerance is exaggerated (McBean and Miller., 1998). According to new research, many people with lactose intolerance can consume the recommended number of servings of dairy foods without experiencing symptoms such as bloating, flatulence, and diarrhea. In fact new research indicates that the addition of lactose containing foods, such as dairy foods, may improve lactose tolerance (McBean and Miller, 1998).

Lactose intolerance and/or milk allergies were discussed in all groups, but no women in the Fredericksburg group reported being lactose intolerant or allergic to milk. At least one woman in the Dublin, Harrisonburg, and Herndon groups commented that they were lactose intolerant or allergic to milk as illustrated by the following, “*See all those things (referring to list of dairy foods) I can’t eat them...I’m allergic to milk.*”; “*I’m allergic (to milk).*”; “*Lactose intolerance, well I’ve had that gassy feeling with dairy foods.*”; and “*Sometimes a lot of people are lactose intolerant, causes gas, bloating.*” In cases where the women stated that they were allergic to milk, they went on to comment about symptoms similar to those related to lactose intolerance or discuss lactase tablets or Lactaid which is a brand name for lactose reduced milk. The following remarks were made by women about the lactase tablets: “*But you can also get tablets. You can eat the tablets.*” and “*I take those lactose pills if I’m going to have a lot of milk...like I’m going to have pizza and then the next night we’re having lasagna or something. I’ll take those and they help break down the whatever.*” Women in one group mentioned that reduced lactose milk was not readily available in the grocery stores. This suggested to the researcher that limited availability of lactose reduced milk might be a contributing factor to reduced milk consumption in those women with lactose intolerance. Reference to lactase tablets and lactose-reduced products suggested to researchers that the women were actually lactose intolerant because such products would not benefit individuals who were allergic to milk. Eddy (1997) also found that educated older women held the misconception that milk allergies were the same thing as lactose intolerance. Some of the women in this study did not state that they had a milk allergy or intolerance for lactose, but instead described intolerance to dairy foods in general

as illustrated by the following, “*It seems to me that milk can really upset your stomach.*” “*Well a lot of people are, they don’t tolerate dairy. It upsets their stomach.*”; “*They (dairy foods) can give you constipation, gas.*”; and “*Like just a bowl of cereal in the morning. I can do the cereal, but if I drink the milk it bothers me.*”

Women in this study were aware of commercially available lactose reduced products and lactase tablet. The researcher observed from women’s comments that some women found lactose intolerance to be a barrier to dairy food consumption while other women did not find lactose intolerance to be a barrier to dairy food consumption. Eddy (1997) reported that lactose intolerance seemed to be a barrier to consumption of dairy foods for educated older women.

Sweet acidophilus milk contains *Lactobacillus acidophilus* and is an option for people who are lactose intolerant. Sweet acidophilus milk is reported to decrease symptoms associated with the consumption of dairy products (Dehkordi et al., 1995). One woman in the Harrisonburg group mentioned using sweet acidophilus milk and commented,

Well, I for one have had a hard time with dairy foods upsetting my stomach, and several years ago I stumbled across something called acidophilus. And since I’ve been taking those I tolerate dairy and have really gained weight. But the acidophilus really help...but since the acidophilus you know it’s completely changed. Yeah, I get at the Farmhouse and acidophilus plus it has 100 grams, it has apple pectin in it, which I hope, which I assume is good for you.

One woman in the Harrisonburg group mentioned she tolerated dairy foods better if she ate them following a meal and commented “*I’ve noticed with lactose intolerance if I eat dairy products on an empty stomach that’s when it will bother my stomach more, so if I want to have an ice cream cone I should eat something like food first.*” Miller et al. (1995a) and Hourigan (1984) reported that lactose is tolerated better when lactose containing foods are consumed with a meal. Also, lactose tolerance depends on the type of dairy food consumed because fermentation reduces the level of lactose found in dairy foods such as cheese and yogurt. One woman indicated she tolerated some dairy foods. This woman also indicated that her tolerance of dairy foods changed after her last pregnancy and commented:

Any of those things (referring to list of dairy foods) give me a bellyache except for regular hard cheese, like American cheese I can eat, pizza I can eat, and I don’t normally get it but that’s umm...how it evolved. After, since this last pregnancy that put me over the edge. My diet was a little different before I had the girls. The twin pregnancy changed my system a lot, and now I can’t tolerate the dairy products as well as I used too, so I take the calcium supplements.

Women who reported being lactose intolerant or allergic to milk indicated that they took calcium supplements to get calcium. Vitamin and mineral supplementation is discussed in detail later in this chapter.

Women in these groups discussed a variety of ways that they dealt with lactose intolerance. In contrast, Eddy (1997) reported that educated, older women, did not discuss ways of dealing with lactose intolerance; however, physicians played a role in the women's misunderstanding of lactose intolerance and milk allergies (Eddy, 1997).

Kidney Stones

Eddy (1997) reported that educated older women discussed kidney stones in relation to dairy foods. One middle aged woman in the Fredericksburg group mentioned kidney stones as she commented, "*Because I know that if you take too much calcium, it can cause kidney stones and other stones. It's true.*" Women in the Dublin group mentioned specifically milk intake and kidney stones. These women commented that family members had kidney stones and limited milk intake. The following comments were made: "*My son and husband both have kidney stones all the time, and they're not supposed to drink milk...my husband never drinks milk either, never.*" and "*My husband never drinks milk. He just passed one (kidney stone).*" Limited intake of dairy foods, specifically milk, to prevent kidney stones by other household members may cause the women in this study to decrease their dairy consumption. Family members influenced food choices of the women in this study, and this is discussed in detail in Chapter VI.

Coe et al. (1992) reported that approximately 3% of women and 10% of men develop kidney stones. The majority (80%) of kidney stones are composed of calcium oxalate and are caused by an underlying metabolic conditions; stones are not caused by excessive calcium intake and may or may not be affected by calcium intake. Treatment of kidney stones requires identification and treatment of the underlying condition (Mahan and Escott-Stump, 1996).

Other Health Conditions

In addition to osteoporosis, lactose intolerance, and kidney stones, dairy foods were mentioned in relation to other health conditions. One woman in the Harrisonburg group mentioned the idea that if consumed in excess calcium settles in the joints as she remarked:

I think I remember having a friend one time whose son drank enormous amounts of milk, similar to what you are describing, and they ended up getting like calcium deposits in their joints. They were very, very painful. Like months the stuff just got into their blood.

Though not a predominant theme, it was interesting that women in the Dublin group associated milk with ulcers. Three women in the group stated that milk soothed their ulcer as illustrated by the following quotes, "*Well, now see milk soothes mine (ulcer).*"; and "*But when mine (ulcer) kicks up, I drink a big glass of milk and it soothes it.*" One woman in the group indicated that milk made her ulcer worse, but commented that other health conditions could contribute to this as follows, "*No, because I'm always going to have a hiatal hernia and ulcer and milk makes it worse (another woman interjects that milk soothes her ulcer) but see, but see I have other things (hiatal hernia) that are, not just milk...see I can't (milk) it'll go down and come right back up.*"

Vitamin and Mineral Supplementation

As noted in previous sections, perceptions of health and nutrition associated with dairy foods can play a role in women choosing to consume dairy foods. Women in this study were aware of the importance of calcium in the prevention of osteoporosis and knew that milk had high calcium content. Some women indicated that they consumed milk specifically for the calcium; however, vitamin and mineral supplementation, especially calcium supplementation, was prevalent among women in all focus groups.

Women were specifically asked questions that addressed the use of calcium supplements. Although no focus group questions addressed other vitamin and mineral supplements, they were discussed in all groups, most often during the discussion of calcium supplementation. The mention of calcium supplementation in all groups initially occurred during the discussion on osteoporosis and was discussed in more detail later in response to the specific question on supplement use.

Women discussed different types of vitamin and mineral supplements. On the sociodemographic questionnaire, 50% of the women indicated that they took a multi-vitamin, while others reported taking a combination of supplements as illustrated in the following response: *“I can go all the way down the line (vitamin) C, (vitamin) E, multi-vitamin.”* When asked if the vitamin-mineral supplements contained calcium, one woman indicated that she was unsure, *“I guess I do (take a multi-vitamin with calcium).”* Another woman indicated that the multi-vitamin she took had calcium but did not contain 100% of the RDA,

This particular multi-vitamin that I take only has 45% (of the RDA) of the calcium that you need. So I supplement that with one of the Tums . I don't know why, I don't know why it's like that, why the vitamins can't have 100% (of the calcium). It can have 100% of everything else, but why is it because of the (vitamin) D or something has to be higher. I'm not sure why that vitamin only has 45% (of the RDA of calcium).

Women indicated that they took supplements because they perceived it to be a good health practice, *“...but I started being a little more conscious (of health). I take a total, it's a total vitamin for woman, women.”*

Vitamin and mineral supplements are the leading non-prescription pharmaceuticals consumed on a regular basis in the U.S. today. The majority of women in this study used supplements. Similarly, other research indicates that supplement use is more common among whites and those with higher incomes and education; also women of all ages are more likely than men to consume supplements on a regular basis (Krummel and Kris-Etherton, 1996; Tripp, 1997). In this study, 77% of the women reported taking at least one vitamin or mineral supplement, and 50% of the women reported taking a vitamin-mineral supplement.

Women discussed different types of calcium supplements. The most frequently mentioned forms were calcium tablets and Tums ; however, when calcium tablets were discussed most women did not specify the brand of calcium supplement. This is indicated in the following quotes: *“Well calcium pills.”*; *“I take calcium tablets everyday.”*; *“I’ve been taking calcium, 600mg, since ’81.”*; and *“Well, I’m trying to find ways to get more calcium. I don’t take Tums , and I take calcium supplements. Because I know I’m over 40, I mean it’s just like the calcium is draining away.”* Although one woman did specify the brand of calcium supplement, *“I take the Mary Kay ones (supplements), they say 1000 mg (calcium per tablet).”* Women also commented that they needed to take supplements with vitamin D, *“Like if you took the capsules with the calcium with (vitamin) D.”* This suggested to the researcher that some women associated vitamin D with calcium.

Women also discussed Tums as a calcium supplement. The following quotes illustrated women’s use of Tums : *“Okay, I take Tums 500, 1500 milligrams a day.”*; *“I do that (take Tums , too. Tums calcium.”*; *“The different colored ones (Tums), and they’re good.”*; *“I take two Tums a day. I think they serve the same purpose (as calcium supplements).”* Some women commented that they preferred Tums over other forms of calcium supplements, *“I wouldn’t take those calcium tablets. I’d just get Tums .”* and *“I didn’t like the horse tablets (calcium tablets).”* A few women indicated that they were unaware that Tums could be used as a calcium supplement, *“With each meal (take Tums), huh. I never heard of that.”* Other women commented that they did not use Tums as a supplement for other reasons as illustrated in the following responses: *“I never take Tums . I associate Tums with an upset stomach. I mean indigestion.”*; *“I’d rather swallow it (calcium supplement) than chew it up (referring to Tums).”*; and *“I don’t like the taste (of Tums).”*

Women in the Harrisonburg group mentioned the use of calcium fortified foods to obtain additional calcium, *“Yeah, calcium fortified orange juice.”*, although another group member responded that calcium fortification changed the taste of the product with the comment, *“It (calcium fortification) makes the orange juice taste bad, I think.”* This discussion suggested to the researcher that calcium fortified foods may be an alternative to the use of calcium supplements, and are a potential source of additional calcium in the diet.

Many of the women took various vitamin and mineral supplements, but had concerns related to supplement use. Women questioned if calcium from supplements was as effective as that found in food, *“But do supplements work as well as natural (sources of calcium).”* and *“It’s (calcium supplement) just not absorbed into your body. Probably in one end and out the other.”* In one group, women discussed whether calcium supplements could be taken with certain medications. One woman made the following comment, *“I’ve heard that with calcium you don’t take it with other medicine or something because it can deplete what ever you’re taking.”* Another woman in the group responded that you just could not take the calcium supplement and medicine at the same time, *“Take the vitamin wait a couple hours before (you) take the antibiotic.”*

Based on comments women made, it suggested to the researcher that the women associated calcium supplements with osteoporosis prevention, and the women felt they needed calcium supplements to meet their calcium needs. Some women explained reasons for supplement use: “*I just take ‘em (supplements) because (I’m) scared of osteoporosis.*”; “*...to prevent osteoporosis. Actually, I’m out of my calcium pills. I have to get some more.*”; and

I’m bad, too. I mean I just take them because I know my diet isn’t calcium rich. I know I’m probably getting more calcium than I think, but I just take them anyway. And I’m starting to take vitamins because I know I don’t get everything I should because I never eat breakfast...I don’t eat like I should, so I’m trying to be at least more healthy that way (by taking supplements).

Other women indicated that they preferred supplements because they found it more convenient to take a supplement, “*I’d rather take a pill. Yeah, it’s easier.*”

The researcher observed that women received information on calcium supplements from physicians and the media. The following quote illustrated physician’s influence: “*Yes (I take calcium supplement), because the doctor told me to.*” External influences, such as physicians and media, are discussed in more detail in Chapter VII.

Although women were aware of the calcium content of dairy foods, this may not have motivated them to consume dairy foods because they mentioned that supplements were meeting their needs. However, a few women were skeptical about supplements adequately meeting their needs. Dairy foods are currently the preferred method to obtain calcium, and based on group discussions related to use of supplements, researchers felt that women need to be educated about the benefit of dairy foods, such as the other nutrients dairy foods provide.

Results of a similar study with educated older women reported that women were using calcium supplements, particularly Tums (Eddy, 1997). While women in this study reported using Tums as a calcium supplement the use of Tums was not as prevalent as that found by Eddy (1997). Slesinski et al. (1995) examined U.S. trends in consumption of vitamin and mineral supplements based on the 1987 and 1992 National Health Interview Surveys (NHIS), and reported that the use of calcium supplements by women decreased from 7.6% in 1987 to 5.7% in 1992. Slesinski et al. (1995) found that in 1992 only 3.7% of adults aged 35 to 44 reported daily use of calcium supplements, while 6.5% of adults aged 45 to 54 reported daily use of calcium supplements. Slesinski et al. (1995) also found that the greatest decrease in calcium supplement use occurred in women aged 55 to 64; this was attributed to increased emphasis on estrogen replacement therapy to prevent and treat osteoporosis following menopause. These focus group discussions suggested to the researcher that women in this study were aware of the calcium content in milk; however, women relied heavily on calcium supplements as well as other supplements to meet perceived calcium needs.

CHAPTER VI

RESULTS AND DISCUSSION:

FACTORS THAT INFLUENCED DAIRY FOOD CHOICES

Introduction

One objective of this study was to determine who/what influenced middle-age women's dairy food choices. Focus group themes and subthemes (Table 3.2) related to factors that influenced dairy food choices are discussed in this chapter. The factors are reported according to the following three themes: preference for dairy foods, product characteristics, and external influences. Women indicated that preference for dairy foods influenced food choices and that these preference changed over the lifecycle. Product characteristics that influence dairy food choices included taste, perceived healthfulness of product, convenience, monetary issues, availability, and packaging. External influences included family, media, and physicians.

Furst et al. (1996) reported that food choices older people make are influenced by value negotiations, which involve weighing and accommodating values that are important, such as sensory perception, monetary issues, convenience, health and nutrition, and quality. Light et al. (1992) reported that a variety of factors affect dairy food choices, such as increased consciousness of health, individual food preferences, family, availability of dairy foods, and price of food items.

Preference for Dairy Foods

Women discussed preference for certain dairy foods when asked about dairy foods they regularly or seldom consume. Preference was also discussed in relation to changes across the lifecycle. Many women reported that they liked and/or disliked dairy foods without identifying specific attributes of the product, such as taste, texture, or perceived health benefits of the product. The following are general comments women made about dairy foods they like and/or consume on a regular basis: "Oh, I like yogurt."; "I eat a lot of cheese. I like cream soups. I love cream soups."; "I'm telling you so could I (eat cheese on dirt). I could. I eat it (cheese) on everything."; "I love milk all the time."; and "I like cottage cheese, too. I like it with peaches on it or something. I eat it just because I like it." One woman commented that she craved milk, "Oh, I do. I like it (milk) with every meal. I could drink milk three times a day. Actually if I don't have milk for a couple days I really crave it, but not as bad as I used to. When I was younger, I used to get a craving and just want milk." Women also commented that they did not have a preference for certain dairy foods, but chose these dairy foods for other reasons:

Yogurt, I just never really liked it much. If I decide I'm going to try to lose some weight, and I don't have any of the richer stuff around then the yogurt tastes pretty good. Yogurt with the fruit in the bottom. I haven't made the decision in any time lately, so I just haven't bought it. And cottage cheese, I don't really like that, but it's like the yogurt. If I'm trying to watch what I eat, and I eat it with

some fruit or something then it tastes pretty good. But if there are other choices I like better then I wouldn't go for the yogurt or the cottage cheese.

Women also commented on dairy foods they disliked or seldom consumed, as illustrated by the following quotes: *"You see, I don't like yogurt, but I don't like milk either."*; *"I don't eat butter. I don't eat ice cream."*; *"I hate buttermilk."*; and *"Oh, I don't like that (extended shelf life milk)."*

When asked why they liked or disliked a certain dairy food, women indicated taste and other sensory attributes, *"It's just the taste (of milk) I don't like. If it's very, very cold, and I'm the same way with water. Water has to be very cold or I won't drink that either."* and *"I do like cream...it's nice and thick and rich. I like it."* Taste and other sensory attributes in relation to dairy food choices are discussed in detail later in the chapter.

Women were asked about their dairy food choices when they eat out. One woman commented, *"I guess when I'm at a restaurant eating, I don't really look at dairy versus non-dairy. It's just what I want."* Many women indicated that the only dairy foods they consumed at a restaurant were sour cream, butter, and cheese. For example, *"When we eat Italian food, I usually get chicken parmesan. Well, well I usually get chicken parmesan, and I always like it 'cause it's got the gooey mozzarella cheese. And I sprinkle parmesan, and I don't worry about the fatty cheese when I get that."*; *"Pizza, cheese sticks, potatoes with sour cream and butter, and all those fattening additives."*; *"The only thing I can think of that I would get (in a restaurant) is a baked potato and a salad. I always have to have the butter and sour cream."* Women frequently commented that restaurants put too much cheese, salad dressing, or cream sauce on foods, which the women thought was unappealing, *"They (restaurants) use so much of it (cheese). I mean some places you go and order something with a little bit of cheese...the cheese is so thick."* and *"Yeah, don't use so much. I hate going to a restaurant when you get so much... so much of a cream sauce all over your food. I always do it (sauce) on the side."*

During the discussion of dairy foods in restaurants, women frequently mentioned that they did not order milk as a beverage. Women had different reasons for not choosing milk as a beverage, as illustrated by the following quotes: *"I don't think it's (milk) very good with certain foods."* and *"(Don't get milk in restaurants) because I get a lot (of milk) at home."* However, a few women reported that they purchased milk as a beverage at restaurants, *"Never (get milk) at restaurant, not unless it's breakfast."*; *"I do. I drink milk (in restaurant), but not on a regular basis."*; and *"I do (get milk in restaurants). Am I the only one? I love milk. I just love it. It tastes good."*

When discussing dairy food preferences, women indicated that milk was associated with certain foods. The following quotes illustrate this belief: *"Yeah, got to have it (milk) with that (peanut butter and jelly sandwich)."*; *"I go to the Brooklyn Deli, and there's one particular sandwich that they have that I almost always order milk with it. No, it's liverwurst. I know it's disgusting, liverwurst. For some reason, I like liverwurst sandwiches with milk. I always have."*; *"Chocolate milk and cake."*; and *"Chocolate milk and peanut butter crackers. That's*

what I'd always eat when I was a kid." One woman in the Harrisonburg group mentioned that dairy foods were "comfort foods", *"I think it's (milk) a comfort food. I mean the peanut butter and jelly tastes good with milk because we were raised on that, and it tastes good, and the cream soups. There's an emotional dynamic to dairy foods that people were given that as children."*

When discussing reduced-fat dairy foods other than milk, most women were not pleased with ice creams, sour cream, and cheeses. Women made comments such as, *"I don't like those (lowfat cheeses) either."*; *"I don't like the low-fat things (dairy foods)."*; *"I buy that non-fat sour cream. I don't much like it. If you put it in something, it's alright, but like on a baked potato fat free sour cream is blah."* Most women mentioned sensory attributes that they disliked about the reduced fat dairy foods; sensory attributes are discussed in detail later in this chapter. A few women indicated that they liked reduced fat dairy products, *"Yeah, that fat free butter I can deal with."* and *"I do (like low-fat ice cream). I eat that. I like it."*

Other researchers have also found that preference was an important factor in choosing dairy foods. Eddy (1997) reported that older women indicated liking some dairy foods without identifying specific attributes of the product. When Eddy (1997) studied factors that influenced dairy food choices of older women, women indicated they were pleased with reduced fat ice creams and yogurt, but were not pleased with reduced fat cheeses. Similarly middle aged women in this study reported disliking low-fat cheeses; however, many middle aged women also reported disliking low-fat ice creams, which contradicted results found by Eddy (1997). Research by KRC Research and Roper Starch Worldwide identified that women did not consume milk because they felt milk did not complement many foods (Anonymous, February 1996). Similarly, middle aged women in this study indicated not consuming milk because they felt it did not complement many foods.

Product Characteristics

Women in this study were asked to rank product characteristics (taste, healthy, economical, and convenience) that influenced their general food choices. Women discussed these characteristics in general and specifically related to dairy foods. Women also mentioned other product characteristics that influenced their food choices, for example availability and packaging issues. Eddy (1997) also reported that product characteristics, such as sensory attributes, packaging issues, and cost, influenced older women's dairy food choices.

Taste and Sensory Attributes

Sensory attributes of a product, especially taste, are major factors that influence food choices. During the ranking activity, many of the women indicated that taste was the first or second most influential factor that influenced food choices. The following responses illustrate this belief: *"If it doesn't taste good, nobody's going to eat it whether it's cheap or healthy or whatever it is."*; *"...but I put taste second. I'm not going to buy something that I don't think tastes good."*; *"Okay, my first one was taste, and I like, I like my food to taste really good. So I have, I have to definitely like what I'm eating, so taste is real important."*; and

Taste is the most important (factor influencing food choices). Well because if it doesn't taste good I'm at the point in my life where it isn't going in my mouth if it doesn't taste good. I take the first bite, and if I do not really like it then I'm not going to eat it. I don't care where I got it or who fixed it or what because I just have...

Women identified taste as the reason they liked certain dairy foods, “*Yeah, yeah (like) milk for two reasons. One because I like the way it tastes.*” However, women more frequently identified taste as a reason they did not consume certain dairy foods, as illustrated by the following responses: “*Milk, I don't like the taste.*”; “*(Don't eat) cottage cheese because it is nasty (tasting).*”; “*Sour cream, I just don't like the taste.*”; “*Eggnog, I don't like. It's nasty (tasting), too. It's too rich, but the kids like it.*”; and “*I just don't like the taste of it (yogurt).*” One woman commented that the aftertaste of yogurt influenced her choice, “*I don't like the aftertaste of yogurt.*”

Temperature was another sensory attribute discussed. When discussing dairy foods in restaurants, women discussed the temperature of milk served in restaurants. Women indicated that it was usually not cold enough, “*I definitely don't like milk in restaurants. It's usually not cold enough.*”; “*It's not cold enough. That's true. Never order milk in a restaurant.*”; and “*(Don't get milk in restaurant) because it's never cold enough. I can't stand it if it's warm. If it's a little warm, I can't stomach it. I can't make myself swallow it.*” Many women commented that they only liked milk if it was really cold, “*(Like milk) only if it's ice cold.*”; “*(Milk) so cold you get an ice cream buzz.*”; and “*Definitely, it's (milk) got to be cold.*” Women recommended that restaurants use “*cold glasses*” and “*chilled glasses, frosty mugs*” to keep milk cold.

When reduced fat dairy foods were discussed, women indicated that they were pleased with skim milk. A few women indicated that they were pleased with other reduced fat dairy products, such as ice cream and cheese, “*I think it's (fat free cheese) good*”; however, many women indicated they disliked these reduced fat dairy foods. Those women who disliked the reduced fat dairy products commented that they disliked the taste, “*The (reduced fat) cheese, the cheese tastes like plastic, but I do like the skim milk.*”; “*But the (reduced fat) ice cream tastes terrible. I don't think it tastes very good lowfat. Why even get it?*”; and “*Some of those fat free cheeses, I don't like the taste of them.*” Women also indicated they disliked the texture of reduced fat dairy, “*It's (reduced fat cheese) rubbery.*” Reduced fat cheese not melting or separating during cooking were other attributes women indicated they disliked, “*It (reduced fat cheese) doesn't melt.*”; “*It (fat free cheese) doesn't melt real good.*”; “*Yeah, they (low fat cheeses) separate.*”; and “*I think they (dairy industry) could do better with the low fat cheeses, and being able to cook and bake with them.*”

Sensory attributes have been found to be important motivators of food choices by other researchers. Eddy (1997) reported that sensory attributes, especially taste, played an important role in influencing older women's dairy food choices. Women in that study reported liking reduced fat ice creams and frozen yogurts; however, they reported disliking reduced fat cheeses. Similarly, Krummel and Kris-Etherton (1996) reported that undesirable sensory qualities were

associated with limited use of reduced fat cheeses. Both health perceptions and sensory attributes were thought to play a role in influencing older women's dairy food choices (Eddy, 1997).

Perceived Healthfulness of Product

Women in all groups indicated that health issues influenced their dairy food choices as discussed earlier. Women also indicated that how healthy a product was perceived to be influenced their food choices. One woman indicated that she tried to choose healthy foods, *“Well, I put number one healthy (factor that influences food choices). I don't want to mislead anyone by putting number one healthy. I only really meant by that I look for something that's not garbage. I'm not a junk food person.”* Women in two groups (Fredericksburg and Harrisonburg) discussed food safety. The women commented that they were concerned about all the preservatives used in food now, as illustrated by the following responses: *“I do read food labels, some of these preservatives and stuff I've never heard of.”*; *“Doesn't some of your milk have preservatives that aren't good for you? At least I heard that.”*; and

They could stop taking out all the good stuff (vitamins and minerals). It seems like they take out all the good, and just leave what's there. And they might add something to say like so they can put on the back of the...box that it meets the daily requirement for this, that or the other, but um I think all the additives and stuff they put in there you know. We are finding to be so harmful. It just seems to me that they're always working on foods, you know to make them lower in calories...

Some women indicated that they limited cheese intake because cheese is unhealthy, *“Oh, I know (cheese bad for cholesterol). I don't eat as much as I used to.”* Women discussed choosing skim milk over higher fat milk because it was healthier, this was discussed in more detail in Chapter V.

Putnam and Duewer (1995) reported that major reasons for decreased milk consumption were concerns about the fat content and the false belief that lower fat milk contains fewer nutrients. Similarly, women in this study questioned the nutrient content of lower fat milk, *“I don't know if it (skim milk) has that much nutrients in it. Does it?”* Women also commented that milk is not as nutrient rich as one may think because the light in the grocery store breaks down nutrients. This belief is illustrated in the following response, *“Of course, because your refrigerator is dark. So the lights (in the grocery store) are breaking them (nutrients) down, and we think we're buying it thinking we're getting some good healthy, vitamin enriched product and we're not. Not like we thought we were.”*

Eddy (1997) reported that the perceived healthfulness of dairy foods influenced older women's food choices. Eddy also reported that older women were pleased with the variety of low fat options available, but were dissatisfied with sensory aspects of the products. Even if women perceive dairy foods to be healthy, that perception may not be adequate motivation to consume dairy foods.

Convenience and Preparation Time of Product

Convenience was a predominant theme; women discussed it in a variety of ways. During the ranking activity, women in three of the groups (Dublin, Harrisonburg, and Herndon) reported that convenience influenced their food choices because of their “fast paced” lifestyle. Women in the Fredericksburg group reported that convenience was not a factor that greatly influenced their food choices. It is interesting to note that in the discussion on convenience none of the women indicated that they liked to cook.

Some women indicated that convenience was a factor that influenced their food choices because of their hectic lifestyle as illustrated by the following quotes: *“Okay, convenience is first (factor that influences food choices). Convenience is first because I don’t like to cook, and I don’t have a lot of time, and if it’s not fast and easy it doesn’t get done around here.”*; *“Convenience is the number one factor because we’re just always running to different places.”*; *“Okay, one is convenience. I work late, crazy hours, so whatever is fast and easy is usually convenient.”*; and *“Um, number two convenience because I live such a fast paced lifestyle. If it’s not convenient, why buy it because it will never get used.”* One woman reported that convenience was important because she lived alone, *“I’m single and almost never cook. If I cook, it’s because I’m heating up something that was left over from the meal I ate the day before maybe. So convenient is the first one.”* One woman commented that convenience was important to her because she felt she deserved the luxury of not having to prepare meals now that her children were not at home, *“Well, I’ve been raising children for the last eon years, and I’m going through middle-aged burnout. So I’m embarrassed to say I put convenience first.”* Other women in the groups reported that convenience influenced their food choices because they worked, but they reported that convenience was not the first or second most influential factors. The following responses during the ranking activity illustrate this belief: *“Third convenience because I work all the time, and I don’t have a lot of time to prepare a lot of things.”*; *“And third I put convenient because we’re always on the go, and if it’s really hard to prepare it will stay in the freezer until I’m like what is that. I don’t know.”*; *“The third one convenience because I’m like them (other group members). If I buy it, and it takes a little while to cook it, it never gets cooked.”*; and *“Three is convenience... convenience number three because I work...just throw something in, heat it, and eat it.”*

A few women in all groups discussed that convenience was not a factor that greatly influenced their food choices. One woman indicated that family members helped prepare meals, so convenience was not a factor that greatly influenced her food choices, *“I put convenience last because I have two teenage children who are very good about helping me out in the kitchen while I’m at work.”* Other women responded that convenience did not influence their food choices because they had time to prepare meals as illustrated by the following responses: *“Fourth convenience, convenience because I’m home all the time, so I have plenty of time to prepare meals.”*; and *“...and then convenience (least influential factor). I’m a housewife, so I’m there to prepare it (food).”* Many of the women who indicated that convenience was important were employed outside the home, while women who reported that convenience did not greatly

influence their food choices were the women who were not employed outside the home. This suggested to the researcher that convenience was more influential to those women who were employed full-time or part-time. One woman commented that she did not cook often, so convenience was not a factor that greatly influenced her, *“I don’t cook that often, so convenience, if I do cook, if it’s a little inconvenient that really doesn’t bother me that much.”* A woman in the Dublin group reported that she used a slow cooker, so convenience was not a factor that greatly influenced her food choices, *“And four convenience because I have a slow cooker. I cook everything in them. I’ve burned up four of them. I use them. It’s (dinner) ready when I get home from work.”* This woman encouraged other group members to use a slow cooker. However, what these women said indicated to the researcher that convenience was important to them.

Sixty-seven percent of the women in this study reported eating out more than one time a week (Table 4.1). Women indicated that they ate out because it was convenient. One woman indicated that her children did not like eating out as frequently as they ate out, *“I think at the moment our favorite restaurant is Clyde’s...we go there often. My husband’s big choice is Bennigan’s at the mall, and the kids go ‘Oh God, not Bennigan’s again’ and I say ‘yeah, it’s better than cooking.’ Let’s go.”* Another woman in the group responded, *“Right we’ll go anywhere as long as we don’t have to cook.”*

The majority of women in this study were employed, either part-time or full-time. Other studies have found that women employed full-time spend less time preparing meals; research indicates that women who work use more convenience foods and eat out more often (Krummel and Kris-Etherton, 1996). Research indicates that 75% of women in their 40’s eat out an average of once every three days, and women over age 50 get “take-out” at least once a month (Krummel and Kris-Etherton, 1996; Sloan, 1997). Sixty-seven percent of the women in this study reported eating out more than one time a week. Women reported that they did not consume dairy foods when eating out because of availability of dairy foods in restaurants and dairy food preferences. Women indicated that skim milk was not available in many restaurants; women also indicated that most dairy foods available in restaurants were high in fat, *“Pizza, cheese sticks, potatoes with sour cream and butter, and all those fattening additives.”* Fat was a predominant reason women mentioned for limiting dairy food consumption, as discussed in Chapter V. Women indicated that they did not consume dairy foods when eating out; this suggested to the researcher that women who eat out frequently maybe at greater risk for not consuming adequate calcium because of limited dairy intake.

Availability of Products

The availability of dairy food was discussed as a factor that influenced dairy food choices. Women discussed availability of certain products. In the Fredericksburg group, the women discussed the availability of individually wrapped cheese slices. The following comments illustrate the women’s perceptions of availability of individually wrapped cheese slices, *“Plus I don’t think Kraft carries their 100% cheese in individual (wrapped packages) like that seriously. It’s like the cheese food comes individually wrapped, but I don’t think the real cheese does.”* and *“I don’t think, I don’t think I’ve ever found it (real cheese) individually wrapped.”* Harrisonburg was the only group to mention sweet acidophilus milk as an alternative for lactose

intolerant individuals. Women in the Harrisonburg group discussed the availability of sweet acidophilus milk, “*Can you buy sweet acidophilus milk?*”; “*Do they still have it (sweet acidophilus milk)? I’ve never seen it in the grocery store.*”; and “*Shenandoah’s Pride used to do that (have sweet acidophilus milk).*”

Women in the Harrisonburg group mentioned that the only type of milk readily available at convenience stores was the extended shelf life milk, and women commented that they were dissatisfied with this trend. The following response is illustrative of this belief, “*Oh, okay. I’ve bought some of that (extended shelf life milk). Go to the 7-Eleven that’s about the only kind they have right now, is that extended shelf life, and I take that home and open. It’s sour (spoiled).*” Women discussed the availability of dairy foods in restaurants briefly. Women indicated that dairy foods available in restaurants were usually high in fat. Women wanted lower fat dairy foods to be available. During this discussion in Dublin, one woman commented that a few restaurants now have low-fat cheese, “*If you go out to eat you get whole fat (cheese). I think Applebee’s has fat free cheese.*”

Women in this study discussed the availability of certain dairy foods. Eddy (1997) found older women discussed availability of smaller packages instead of certain dairy foods. Older women felt smaller containers were not readily available. Older women felt that large containers were wasteful because the food tended to spoil before it was used; these women commented that they would purchase certain dairy foods more regularly if smaller container’s were more readily available (Eddy, 1997). Middle age women in this study did not discuss the availability of smaller containers, this may be due to the fact that all but one of the women lived with others.

Monetary Issues

Participants were not low-income, but they discussed cost of food items as a factor that influenced food choices. Cost was initially discussed in the ranking activity relative to food in general, and later in the discussions it was mentioned specifically in relation to dairy foods.

Women mentioned that cost greatly influenced their food choices as illustrated by the following quote: “*I put economical first (factor that influences food choices) because I am, I support four people on one income, and if it’s expensive I won’t buy it.*” One woman in the Harrisonburg group mentioned that price was a factor that influenced her decision to eat out, “*Um, I put one economical. I’m just an economical (person). I hate to pay a lot for a meal. That bothers me when I’m out cause I know I could have made it at home for a lot less, so I really try to be economical.*” Another woman indicated that if a food item was economical she would make it meet all the other criteria (taste, healthy, and convenience) in the ranking activity:

Well, I read this ‘order of importance to you’. I didn’t consider anybody else in my family because I’m the one I’m talking about right now. Economical, first because if I get a good deal on it I’ll buy it, and if it’s a good deal it will taste good. It will be convenient, and I will make it healthy.

Other women indicated that cost influenced food choices, but it was not the most influential

factor. The following quotes illustrate this belief: “...and economical I put last (fourth factor) although I can’t splurge very often, but it’s not the most important factor.”; “Number three economical, I try and watch the grocery bill.”; “...and third is economical because we have to keep say within a certain budget.”; “Economical, is (last) just because you don’t want to spend (a lot of money). Once in a while it’s okay to spend a lot but...” . A few women indicated that cost had little influence on their food choices, “Number three economical because I figure I can cut corners somewhere else.”; “...and the fourth one’s economical because I figure got to spend the money on something and eating’s about all I have time to do, and I’m honest.”; “Economical last because I don’t care. If I like it, I’m going to buy it. I don’t care what it costs.”; and “...and I really don’t care about economical or convenience. I’ll buy Del Monte over Food Lion) any day.”

Women discussed convenience as a factor that greatly influenced food choices as previously discussed. The emphasis on convenience could have been one reason economical was not a predominant factor with some women. This belief is illustrated in the following responses: “...and number four was economical because when you go for more convenience type things, they’re not going to be the cheaper things.”; “...and fourth I put economical because I think if you go for convenience it always costs more, so that’s what I said.”; and “...and then four economical because I just don’t think there’s any such thing anymore. If you want something convenient and fast, you’re going to pay for it. You know, so if you’re going to go out of your way to save money, and economical foods are the more fattening foods.”

Women discussed cost specifically in relation to dairy foods in three groups (Fredericksburg, Harrisonburg, and Dublin). When asked about changes or suggestions they had for the dairy industry women commented, “...also cheaper” and “(satisfied with dairy) unless they want to lower the price.” Women indicated that the price of dairy did not deter them from purchasing dairy foods, but that a decreased price would be appealing, “...not that I think it’s (dairy foods) too expensive, but that’s always appealing. If they want to catch your attention, run a special or just lower the price.” However, one woman commented that she did not purchase cottage cheese because it was not economical, “...and no matter how much you mix it (watery cottage cheese) with pineapple, the water is still floating. It’s gross, and it’s not economical because you waste it.” Women discussed that dairy food intake would not increase if dairy foods were cheaper as illustrated by the following responses: “...but I’m not sure people would buy more (dairy foods) even if the price goes down, and I believe the dairy farmers will tell you they’re barely making it.” and

I’m not sure you would buy more (dairy foods if the price were lower). I think we buy what we perceive we need to do the meals and eat the cereal and put in the coffee, you know. I’m not sure we really would (buy more dairy if it was cheaper). I’m not sure most American consumers are cutting themselves back because it’s (dairy foods) just too expensive. It’s not like, it’s not, most of us do not consider it (dairy) as a luxury food. It’s something that we can choose. We put it in our grocery cart because we need it, like bread and eggs. They’re required things.

One woman indicated that her intake of dairy foods, specifically milk, was influenced by cost during her childhood:

We used to drink whole milk when I was a kid, but there were seven kids in the family. And I guess, um, Mom couldn't really afford to have that much milk around. Until you were like the age of ten or something like that, you could have as much milk as you wanted, but then she (mother) started cutting us off to like one glass (of milk) a day, and like I said I never ate cheese, but man I could eat the butter...

No other women discussed cost as a factor that influenced dairy food choices or consumption across the lifecycle.

Eddy (1997) reported that older women mentioned cost as a factor that influenced food choices; the women wanted smaller containers, but they felt smaller containers were not cost effective. Older women also indicated that nutritionally modified foods were more expensive. The older women reported purchasing store brands to save money (Eddy, 1997). Research also indicates that Baby Boomers are more likely to purchase store brands (Food Insight, 1997; Light, 1988). Clauson (1995) reported that the slight increase in the price of dairy foods between 1994 and 1996 did not decrease the total sale of dairy foods. Middle age women in this study indicated that price was not a deterrent to purchasing dairy foods; women felt that milk was a staple food that they purchased because they felt they should.

Packaging Issues

Packaging was an issue mentioned, in three of the groups (Fredericksburg, Dublin, and Harrisonburg), when discussing improvements that the dairy industry could make. Women discussed ideas for making the packaging more aesthetically pleasing, as illustrated by the following comments: *"I'd like a picture of a cow on milk, a pasture or something. You know how you kind of go toward country type things. You think of them being healthier. I think if you had a nice picture on the front..."; "Make the gallon (of milk) look like the cow (referring to cow shaped creamer pitchers)."; and "Sour cream and everything is usually in red and white packaging or something. If it looked prettier."* One woman reported that the aesthetics of the package did not influence her, *"If I like it (dairy food), I'm going to buy it whether it's (package) purple or green or whatever."*

Women discussed the size of packages. Women in the Dublin group discussed that milk cartons in schools needed to be larger because a half-pint was not enough milk. The following responses illustrate that belief: *"They (milk cartons at school) need to be bigger, too. Instead of the half-pint, they'd like a pint because a lot of times to get enough to drink they (kids) have to get another (milk)."* and *"That (milk carton too small) was always the problem in school."* However, one woman mentioned that some school children do not need the pint-size milk, *"Well, like the kindergartners, like they don't drink the whole half-pint."*

One woman indicated that buttermilk used to come in a smaller container that was just the right size for baking, but that buttermilk no longer was available in the smaller container:

...and I like to use. I like to cook with buttermilk, bake with buttermilk, and you used to be able to pretty regularly find a pint size and that's hard to find now. And I'm sure that's because there just wasn't enough demand for it because people weren't drinking it as a beverage because it doesn't taste very good. But it's great for cooking, that pint size is. But I wouldn't suggest the dairy industry go out and do that (buttermilk in pint container) because obviously I may be one of one out of a million (people) that actually use it.

Women reported that they liked cottage cheese in the smaller containers because the large containers were a waste of money. Women commented: “...and it (cottage cheese in the tub/large container) got water in it.”; “...and it (cottage cheese in the large container) got watery so fast. I mean the packaging.”; and “Well, they've changed on the cottage cheese. I like cottage cheese, and they've got it now in the little small packages. So I can take like one of those to work. Before you had the tub.” However, women discussed that single serve packages were more expensive, “Yeah, they could make them in single servings and bring the price down. Anything in single servings is always sky high, so write them a letter about this.” The cost associated with single serve packaging could be a deterrent to choosing dairy food items in smaller packages. Eddy (1997) reported that older women wanted dairy foods in smaller containers. The older women reported that large family size containers were a waste of money because the food spoiled before it could be used; however, the women did not mention single serving packages being too expensive (Eddy, 1997). Eddy (1997) reported that older women indicated that they would purchase more dairy foods if they were available in smaller containers.

Another packaging issue discussed in the three groups was the difficulty in opening certain types of packages. The types of problems mentioned included opening cardboard milk cartons, sour cream containers, and aluminum wrapped cream cheese. Problems discussed were not consistent among groups, but problems mentioned in one group often resulted in agreement from other group members. In one focus group a woman commented on a problem with sour cream and cream cheese containers, “I'm so tired of buying sour cream and sometimes the cream cheese in those little ‘cheesy’ plastic containers, and you're supposed to rip the top up and they split. And then what do you do? You got to put it in something else. So they need to be in better containers.” Following this comment, another group member commented, “Well also what about the whipping cream and milk. You know the little ones you have to go like this, to pull it out (A fellow group member interjects, ‘The little cardboard containers’). I have had some that I have actually just taken a knife and jabbed it in there.” In one group, a woman mentioned that cardboard milk containers in schools should be easier to open, “Milk, they (dairy industry) need to change for school kids because half of them can't open them...but they (dairy industry) do need to make something simpler for kids at school.” A fellow group member responded, “They (kindergartners) don't even have time to get it (milk carton) open (before lunch is over).” Women mentioned they liked the twist top lids on cardboard cartons, “A lot of them (cardboard cartons) are going to the little twisty tops now” and “They should (milk cartons have twist tops

lids).” Other women indicated that it was difficult to open cream cheese in aluminum foil package and that the food had to be stored in another container after being opened, “*How about the cream cheese. It’s wrapped in this like dual stainless steel, plastic foil, and you try and cut that open, and it’s like all stuck in the corners. And then you can’t wrap it back up, so you got to put in something else anyway.*”

Women expressed dissatisfaction with the way that dairy foods were packaged, but it was unclear from this study if easier to open packages would motivate women to purchase more dairy foods. Eddy (1997) reported that older women discussed difficulty in opening certain types of packages, such as plastic milk cartons, zip pack cheese, and aluminum wrapped cream cheese. Older women indicated difficulty with certain packages was due to declining vision and problems with their hands (Eddy, 1997).

Women in two groups (Harrisonburg and Fredericksburg) discussed the new opaque plastic milk cartons, “*Well just that thing we were talking about before, your milk in containers that you can’t see through, that aren’t clear.*” Some women indicated that they wanted the opaque milk containers, “*Oh, that’s right. I want my milk in a container that does not get any light. That’s the way I want to buy it and I just...*” and “*I buy it (milk) sometimes in yellow (cartons).*” When asked why they wanted the opaque cartons, women made comments such as, “*It’s (opaque cartons) something about keeping it (milk) fresh because there’s something in it that goes bad.*”; “*The light does something (to the milk).*”; and “*The vitamin, the vitamin retention or something.*” Responses such as these suggested to the researcher that women were not sure why milk is packaged in opaque cartons. One woman indicated that she did not want her milk in an opaque container:

Yes (happy with dairy packaging), except for one thing. Where my mother lives they (grocery stores) are now selling milk in these containers you can’t see through. Yeah, I don’t like that at all, and I go to her house. I don’t like not being able to see the milk in there. I think it goes back to maybe when I was growing up, and you could see it, and you could shake it (to mix it up). Um, I guess if I have a question about what’s the date on this (milk), if I can’t find the date I can at least look at it, and, or it’s easy to see how much is in there. When you take it (opaque carton) out, you can’t see anything.

Women frequently mentioned that ice cream packaging could be improved. Women commented that the current cardboard containers tend to get “soggy”, “*The ice cream (container). The cardboard containers tend to get soggy.*” Women also mentioned that the flip top ice cream containers were not satisfactory because the ice cream got freezer burn, as illustrated by the following quotes: “*Yeah, if you don’t eat them (ice cream in flip top containers) real quick (get freezer burn).*” and “*The ice cream containers (flip top cardboard containers), to put them in the freezer they tend to get the freezer burn.*” One woman indicated that Breyer’s ice cream came in a better container:

Well like Breyer’s ice cream stays better in the freezer because it’s in a better

container. If it's got that flat lid usually, and I mean everyone knows my husband if ice cream goes bad in my house he is slow (a group member interjects, 'he's sick'), right. Cause he loves ice cream, but if it's the kind that's got that flap, you know the last third of it (gets freezer burn). I almost always throw it out because it gets those ice crystals on there and starts tasting like freezer. So the packaging for that ice cream with just the flap is not, not as good.

Women briefly mentioned that they liked zip pack cheese, “*Those zip bags. You can buy a large quantity, but it (cheese) doesn't get hard on the edges.*” and “*Yeah, they do have the little ziploc (bag) cheeses.*”

Other Product Characteristics

Though not a predominant theme, it was interesting that women in the Dublin group discussed the expiration date on dairy foods, “*The date that you have to check and make sure it's (dairy food) not expired.*” Women in this group mentioned that the expiration date was one reason they did not choose dairy foods in restaurants, “*I don't trust dairy (in restaurants). I can't see the date. You run a restaurant, and you buy the stuff in big quantities. And nobody orders this particular thing for three or four days, and I feel like they're serving it to you. I just don't trust it.*”; “*If you've ever worked in a restaurant you're probably even more suspicious... sometimes it's (dairy foods) not refrigerated like it's supposed to be. It's out in the open longer than it should be.*”; and “*How often do they change the cottage cheese that sits in the salad bars. Do they (restaurants) just put the lid on it...do they drain the water off the top and set it right back (in the salad bar).*” This suggested to the researcher that women were aware that dairy foods are perishable, and that they questioned the safety of dairy foods in restaurants.

Eddy (1997) reported that the expiration date was a factor that influenced older women's dairy food choices. The issue of expiration date with older women related to package size and diminished vision. Older women expressed confusion about “Use by” and “Sell by” labels on dairy foods (Eddy, 1997).

Women in the Fredericksburg group discussed that the name of a product influenced their food choices. One woman commented that the name has a psychological effect, “*See that's (name of the product) having a psychological effect on you.*” One woman mentioned that she would not purchase a certain brand of ice cream because of the brand name, “*Well, it's like that ice cream, have you seen that ice cream Turkey Hill Farms ice cream. It totally turned me off right there.*” Other women in the group agreed that they would not purchase that brand of ice cream either, “*I would never buy Turkey Hill Farms ice cream.*” and “*Turkey Hill Farms ice cream, just because turkey, ice cream, no I'm not interested.*”

External Influences

Women in this study were asked to discuss dairy food advertisements in magazines and on television. Although not specifically asked about other external influences, women discussed family and physicians as external factors that influenced dairy food choices. Eddy (1997)

reported that seminars and literature were ways older women received information about health and nutrition. Eddy (1997) also reported that physicians influenced many aspects of older women's food choices, but family was not identified as a strong influencing factor as many of the women lived alone.

Family

Family was the predominant external factor in all groups. All of the women, except one, lived with their spouse or children, which might explain family influence related to food choices. Women commented that their parents, spouse, and children influenced their food choices.

During the discussion of the lifecycle, women indicated that their parents influenced their dairy food choices when they were children. Women commented on dairy foods they ate when growing up as illustrated by the following quotes: "*(As a child) I remember drinking milk, and we used butter, but I don't remember having a lot of other milk products. We had ice cream at home. I don't think I ever considered yogurt as a child.*"; "*My mother used to mix up this what she called 'big milk' and she would beat eggs in it and then put milk in it and sugar, vanilla.*"; "*My mom used to make me a lot of pudding.*"; and "*Yeah, we used to eat a lot of pudding and ice cream (as kids), but we never had cream foods or anything.*" One woman indicated that her parents influenced her dairy food choices as a child because of religious practices:

Well we drank milk. My mother served milk with breakfast and lunch, but with dinner we didn't because we were sort of keeping Kosher back then, sort of, you don't do milk and meat. You don't do milk and meat together. So if we were having steak or hamburger or chicken we couldn't have milk with it.

One woman indicated that food choices had been acquired from parents, "*...margarine to cook, butter to eat. I still, and I still feel that way. It's one of those ingrained things, you know.*" Women indicated that they were forced to drink milk as children as illustrated by the following responses: "*I always had this big tall glass (of milk) placed (in front of me) even when I was in high school, at breakfast time*" and

Did your mother make you drink so much milk a day? My mother made me drink a small glass at breakfast, and some at night before I went to bed. I think that's why I had sleeping problems when I was young, all this milk that I didn't like. I fought against that (milk)...mother thought it was good for me.

Women also commented that parents' perceptions did not always influence their food choices. This was illustrated by the women's discussion of skim milk. Many of the women indicated that they drank skim milk to reduce fat in the diet; however, women mentioned that their parents did not have a preference for skim milk, "*My dad wouldn't drink skim milk. He called it 'old blue john'.*" and "*That's what they (parents) call it (skim milk) is 'blue john'.*"

Women indicated their spouse currently influenced their food choices. During the ranking

activity, many of the women commented that “healthy” was the first or second most important factor that influenced food choices because of a spouse’s health. This was illustrated in responses such as, “*I put healthy first. I don’t always go that way, but I try to go that way because my husband’s got high blood pressure, and our cholesterol both is high.*”; “*Okay, I put number one healthy... (husband) diabetic, so I try to watch what we get, but we don’t always stick to it either.*”; “*I put number one healthy because of having a husband with heart problems...we have to watch it (health).*”; and “*Healthy (second factor that influences food choices), my husband is fighting high cholesterol.*” Women also commented that their dairy food choices were influenced by their spouse’s concern for health as illustrated by the following response:

My husband is real conscious with his, uh, just real healthy conscious. Now that’s why healthy is first. I do look at that and he does, too. And he likes to go to the grocery store, so I let him. But we used to drink 2% (milk), got down to 1%, and that was kind of hard. And he got me down to ½%, and I can’t go any lower than that kind of milk. But it took two years to get there. But he’ll always look for fat free. I yelled at him for getting fat free cream cheese. I don’t like that...there are certain things that I can not go down to that (fat free)...he drinks milk...he’s the one making us go down lower, from 2% to 1% to ½%, and I think he even tried skim milk one time. Doesn’t matter, I don’t drink it (milk) anyway, just with cereal.

One woman indicated that her milk intake increased when she was pregnant because of her spouse, as she commented:

My husband made me drink milk when I was pregnant. He, I mean, he would fix my milk for me, and bring it to me, and say ‘you need this’. When I got home that was always it, and he wouldn’t let me drink, I’m a tea drinker, and he would fix me a glass of milk instead of making tea because he knew I’d drink the tea.

One woman commented that her intake of cheese increased as a result of her spouse’s ethnic background, “...and also (consume regularly) cheese, because I’m married to a Mexican, and it’s got to be on everything.”

Women in this study discussed children as a factor that influenced food choices, “*When you have kids, you know (they influence food choices).*” Children were a factor that influenced all food choices as illustrated by the following quotes, “*Yeah, yeah, my number one (factor that influences food choices), well I have, I put healthy because I have kids, and I want them to eat right.*”; “*I put taste number one. Healthy two because I try to think of...(children) and forget about mom.*”; and “*I did healthy because I have children...and second, economical just because of kids. I have to do the bargain stuff.*” Children also influenced dairy food choices made by the women, “*We do 2% (milk) now, but for the children we still...(children) still need whole milk*” and “*2% (milk) because it was on sale at Safeway (grocery store) with a coupon last week, and my daughter didn’t like it. She still prefers the whole milk.*” One woman indicated that her dairy

intake, specifically milk intake, increased because of her children,

I'm drinking more milk because my son's learned to drink skim milk, and he's 17 and I buy it like just for he and I at least 4 gallons of milk a week. He and I consume that much. He just loves it, so I've been drinking more because I buy more of it. I mean I buy 3 gallons week, and then go back and get it (milk). So that's, I'm glad he drinks skim milk instead of whole milk. He doesn't like whole milk.

Women in this study indicated that family greatly influenced their food choices, specifically dairy food choices. Eddy (1997) found that family had a limited influence in educated, older women and speculated that this could be due to the fact that most of the women lived alone. Eddy (1997) postulated that family influence might be more predominant in middle aged women. Previous research indicates that food preferences are transferred from parent to child (Furst et al., 1996; Wyrwicka, 1981). One study reported that 69% of the women adopted nutrition habits from their mothers (Stafleu et al., 1995).

Media

Women mentioned that their food choices were influenced by advertisements. Women indicated that they noticed advertisements in magazines and on the television. One participant did not have television, *"I don't have TV, so I don't see (advertisements)."*; however, this woman was familiar with advertisements found in magazines. One woman indicated that advertisements did not influence her food choices, *"There really isn't anything. If I like it, I like it, and I will eat or drink it. But commercials and ads don't really affect me."* This woman also stated *"The only way commercials affect me is if I see a commercial that offends me or that I don't like. I will not buy the product, if I find it very offensive."* which suggested to the researcher that this woman's food choices could be influenced by advertisements.

Women discussed specific advertisements and how they influenced dairy food choices. Women in this study, when asked about dairy advertisements, named some recent campaigns, *"Got milk?"*; *"Milk does the body good."*; and *"I like the one that I haven't seen it in a while where there's the boy or the girl and they go through to adulthood, and you see how they grow. That's cute."* Women discussed the milk mustache campaign in detail. Women might have been more familiar with the milk mustache campaign because it is current and prevalent in magazines and posters. Women stated that the milk mustache advertisements were very common as illustrated by the following quote: *"I think the (milk) mustache one has taken over everything. I mean every magazine."* The majority of women commented that they did not like the milk mustache as illustrated by the following quotes, *"The advertisement with the mustache, it's not appealing. It, it makes me want to wipe their face off and go oh yuck! If my kids looked like that I'd send them to the bathroom."*; *"The one with the milk across your lip. I hate Martha Stewart with a milk mustache. It's so gross."*; *"The mustache, I hate it. It's so gross. I don't even like to look at it. When I see it I turn the page. I think it's nasty looking. Do you like it? (asking other group members)"*; and *"They have these famous people on and they have these big milk mustaches. It's terrible!"* Few women commented that they liked the milk mustache

advertisements because they thought they were cute, *“I like the milk mustache, think it’s cute.”* and *“I think they’re (milk mustache advertisements) cute. All the stars.”* Women in all groups felt that the milk mustache was an effective campaign whether they liked it or not. The following responses illustrated that belief: *“It’s (milk mustache advertisements) nauseating, but it probably works.”*; *“I think it’s (milk mustache) catchy. You can’t help but notice it.”*; *“It’s (milk mustache) good advertisement.”*; and *“(Milk mustache) that’s the only one (advertisement) I remember is the milk one. Definitely though it’ does make an impression though. You remember it.”* One woman in the Fredericksburg group commented, *“(Milk mustache campaign) it’s never impacted me in any way.”* Women reported that the milk mustache campaign was “catchy”, but that the advertisement did not influence their food choices, *“It’s (milk mustache) not going to make me want to drink more milk.”* A possible explanation for this is the perception that these advertisements are focused on children and young adults, *“It’s (milk mustache) probably, it’s probably geared towards the younger kids anyway.”* Women in the Harrisonburg group discussed that the mustache could not be real milk, *“It (mustache) couldn’t be milk and stay on. It wouldn’t stay there.”* and *“Somebody told me that those ads in the magazines with the umm mustache, it’s yogurt. They put yogurt on the people to make it stay on.”*

Other advertisements were mentioned less often than the milk mustache. The following responses indicate other advertisements discussed in the groups: *“Well, one of my favorites is that TV one (got milk?) with the guy in the mummy suit and the cookies.”*; *“My favorite one is the one where the guy has the peanut butter in his mouth, and the radio station calls him up and asks him the question. And he doesn’t have any milk to wash down the peanut butter.”*; and *“(Got milk? commercials) they make me want to have to go drink milk. When you’re watching the people eating cookies and everything. I’m dying for those people because they need milk bad.”* One woman indicated that she disliked certain advertisements because they made women look stupid, *“(Flavored creamer commercial) sawing the milk open makes us (women) look stupid. I hate that commercial. I mean it’s so dumb, and she splatters milk all over her because she’s not using the milk with the screw on cap. It makes us (women) look stupid.”*

Women mentioned advertisements that were not related to dairy. These advertisements were mentioned and discussed because of the cow. The researcher speculated that these foods were mentioned and discussed because the cow in the advertisement led the women to associate the product with dairy foods. The following quotes illustrate this misconception: *“Somebody has one that has little skinny cows (Hershey’s chocolate).”*; *“I like the ad right now. I forget what the ads for, but something dairy and you’ve got the cow, the fat cow (Hershey’s chocolate).”*; and *“I like the one where does chocolate milk come from, from brown cows or something (Hershey’s chocolate syrup advertisement).”* One woman responded, *“Hershey’s chocolate. It’s really for chocolate not for dairy”*, which suggested to the researcher that not all women held the misconception that advertisements with cows were related to dairy foods. Women in three of the groups mentioned chocolate as a dairy food during the listing activity. Terms, such as milk chocolate, may be one reason for this misconception. Also, chocolate is a common flavor for many dairy foods, for example chocolate milk, chocolate ice cream, and chocolate milkshakes. The misconception that chocolate is a dairy food could be another reason these commercials were discussed.

In two group discussions, women indicated that they received nutrition information from the newspaper and other literary sources, such as research papers. When discussing packaging, one woman indicated that she wanted dark milk containers because of information she read, *“Because everything I’ve read in the last couple of years says that just exposed to light all those vitamins you lose. Like 3/4ths of the vitamins that are in the milk.”* Other women indicated that they also received information from magazines,

Coffee does it (take calcium out of your bones). I was reading about that in a magazine a couple of days ago. Coffee will take the calcium out. Skim milk in you coffee will take away whatever the coffee is flushing out of your system. Caffeine (another group member interjects ‘decaffeinated probably wouldn’t be that way’) I, I don’t know it just said coffee. It said if you use as much as a juice glass of skim milk a day it will kind of erase the effects the coffee has.

Food safety was discussed as an issue they learned about through media. Women in the Fredericksburg group indicated that information they received from the evening news influenced their dairy food choices, *“Oh that growth hormone. Every time that comes on the news I swear I’m not drinking anymore milk.”* This comment started a discussion on growth hormones and preservatives in milk. The following responses were part of that discussion and represent beliefs that could influence dairy food choices: *“Doesn’t some of your milk have preservatives that aren’t good for you?”*; *“And it (growth hormone) goes right into the milk.”*; and *“The poor cows (because injected with growth hormone).”*

Eddy (1997) reported that educated older women received information about health and nutrition through seminars and literature. These older women also discussed the Food Guide Pyramid and nutrition labels on food products as methods they used to obtain nutrition information (Eddy, 1997). Middle age women in this study reported that they received the majority of nutrition information from magazines and television. This finding could be due to the fact that the women were specifically asked about dairy advertisements and probes used were related to advertisements from magazines and television. Krummel and Kris-Etherton (1996) reported that women received the majority of their nutrition information from magazines, newspapers, and television; however, less than 10% of the women reported changing food habits as a result of what they read in magazines and the newspaper and from what they heard from the television. The lack of change in food habits as a result of information received from the media could be a result of conflicting messages from various sources (Food Marketing Institute, 1997).

Physicians

Eddy (1997) reported that physicians influenced many aspects of older women’s food choices. Older women frequently reported that physicians advised them to make changes in dairy food intake (Eddy, 1997). According to results of the sociodemographic questionnaire and group discussions, only two women in this study followed a diet prescribed by a physician for health reasons.

In this study, physicians were mentioned only once in relation to dairy food choices. When asked about changes across the lifecycle, one woman indicated that a physician influenced her intake of dairy foods as a child,

Well I remember my mother took me to the doctor because I wouldn't drink milk, and they used to, when you were in Elementary school back in those days, you had to drink your milk...and I would throw it up, so my mom finally went and said look 'don't make her drink the milk'. So she, the doctor said 'what does she like that is dairy products' and she (mother) said 'she loves ice cream.' So she (doctor) said 'let her have all the ice cream she wants', so I used to, I used to have ice cream for breakfast sometimes...so I did a lot of ice cream as a kid, now I just don't eat a lot of ice cream, but I still don't drink milk

The lack of physician influence on food choices in this age group of women could be due to the women not having multiple health problems or chronic diseases. Eddy (1997) found that physicians influenced older women's food choices; however older women commonly have multiple health problems.

The biggest influence physicians had on middle age women was the use of supplements. When asked what influenced them to take calcium supplements, women often cited their physician. Women indicated that physicians recommended they take calcium supplements during pregnancy, for example

Yeah, I remember the doctor asking me (when I was pregnant) 'do you drink milk?', and I said 'no'. And he gave me this pill (calcium supplement). I swear it was about this size (indicates large pill size with hands). They were bright yellow and they were huge. I had to take them.

(During pregnancy) But the doctor told me to take Tums . I took Tums . I mean he told me to eat, probably need them anyway (referring to heartburn), but he told me to eat at least two every day Tums . It says right on there a good source of calcium.

Women also indicated that physicians recommended calcium supplementation prior to and following menopause. The following quotes are illustrative: “*Yeah, he (physician) told me indefinitely (take calcium supplements)*”; “*Because the doctor told me to (take Tums)*”; and “*Yes (take calcium supplements), because the doctor told me to...He said 'when you reach your age it's time to start thinking about calcium' (another group member interjects 'and how old would that be?')* 44.” One woman indicated that the physician referred her to a pharmacist to decide which calcium supplement to take, “*The doctor also said don't take (calcium) citrate, ask the pharmacist what he recommends.*” Eddy (1997) reported that physicians greatly influenced older women to take calcium supplements, especially Tums , to increase calcium intake.

CHAPTER VII

CONCLUSIONS

Introduction

The National Institutes of Health strategy for optimal calcium intake includes both private and public sectors. In the public sector, NIH recommended the development of health education programs and materials that would meet the needs of the diverse American population. The National Institute of Health, in the private sector, recommended that the food industry develop a variety of calcium-rich foods. In this chapter, suggestions are made for nutrition education and product development based on the findings from this study because these ideas might influence middle age women to increase their consumption of dairy foods.

Major Findings

The focus group participants represented the group targeted, which was educated, non-Hispanic white middle aged women. The majority of women indicated that they lived with a spouse and/or child; however, there was diversity as a result of where the women were in relation to starting a family. Women indicated that their spouse and children significantly influenced their dairy food choices. Results from the sociodemographic questionnaire indicate that the majority of women were employed part-time or full-time. The sociodemographic characteristics also indicate that the women “always” or “almost always” prepared meals for the household. Many of the women indicated that convenience was an important factor that influenced food choices.

These women indicated that they participated in the study because they were interested in calcium and osteoporosis. Many of the women indicated that they were premenopausal or menopausal which they felt increased their risk for osteoporosis. Women discussed the use of calcium supplements and calcium from milk in relation to osteoporosis prevention. Women discussed health benefits of dairy foods in relation to milk and disadvantages of dairy foods in relation to other dairy foods. This suggested to the researcher that these women perceived milk as “healthy” and thought it was the most nutritious dairy food. This perception may be explained by the media influence because many advertisements and commercials focus on milk.

Many women followed a low fat diet, which indicated they were conscious of fat in their diets. The emphasis placed on fat by the media may explain women’s perception that fat is a disadvantage of foods. Several women perceived many dairy foods to be high in fat and reported using low fat dairy products, such as skim milk. Women expressed an interest in reduced fat cheeses and ice cream; however, they reported current reduced fat and low fat dairy products have an unacceptable taste and texture.

Although not directly discussed women addressed barriers to the consumption of certain

dairy foods. Women indicated that the issue of freshness deterred them from purchasing dairy foods in restaurants. Women also indicated that milk does not compliment many food items offered in restaurants.

There are some limitations to this study. Results from this study represent a specific group of women and are not generalizable to all women. The checklist, *How Much Dairy Did You Eat Yesterday?*, indicated dairy food intake for the previous day which may not be representative of a typical days dairy food intake. The checklist was completed at the end of the discussion, which may have biased the results; however, the checklist was not done at the beginning of the discussion because it could bias the entire discussion. The checklist was also a limitation because it contained a limited number of dairy foods. The suggestions for product development and promotion and nutrition education are only suggestions because of the limitations of the study. Future research needs to be done on a larger more diversified group of women before any real changes in product development and promotion and nutrition education can be initiated.

Suggestions for Promotion and Development of Dairy Foods

Considering Baby Boomers are the largest generation in the U.S., it would be beneficial to develop products designed to meet the needs of this age group. Products developed to meet the needs of this age group along with effective advertisement of these products might increase consumption of dairy foods. Increased consumption of dairy foods would result in increased calcium intake, which is necessary for the prevention of osteoporosis. Osteoporosis related health care costs were an estimated 10 billion in 1991 (Avioli, 1991), and are expected to increase to \$60 billion by the year 2000 (McBean et al., 1994). Osteoporosis related health care costs will continue to increase as Baby Boomers continue to age. Prevention of osteoporosis would mean a significant decrease in health care costs related to osteoporosis. Individuals who consume the recommended number of servings of dairy foods per day can meet the minimum calcium requirement. The National Institutes of Health (1994) encourage consumption of the minimum recommended dietary intake of calcium throughout the lifecycle. The dairy industry has already begun to fortify selected dairy foods with calcium, for example some brands of yogurt are supplemented with additional calcium. The dairy industry should consider supplementing other dairy foods with calcium as a way to increase calcium intake in the U.S. Only one group discussed calcium fortified foods which suggests women are not aware of calcium fortified foods. Dairy industry could promote calcium fortified foods with slogans such as, "Now contains more calcium" and "calcium rich". When promoting dairy foods, calcium content of all dairy foods could be promoted because these women seemed to associate calcium with milk but not with other dairy foods. Marketing campaigns might include information about nutrients, other than calcium, in dairy foods.

Fat was the predominant negative theme throughout all focus group discussions. Women were aware of the fat in their diets, as many followed a low fat diet, and they perceived dairy foods to be high in fat. Women reported that they regularly consumed reduced fat dairy products, such as skim milk; however, they indicated that they found reduced fat cheeses, ice cream, sour

cream, and cream cheese unacceptable. Sensory attributes, such as taste and texture, were identified as reasons the reduced fat dairy foods were unacceptable. Women in these groups indicated a need for reduced fat cheese that melts. The food industry should continue to provide reduced fat dairy options; however, the food industry needs to continue to try to develop a high quality low fat formulation so sensory attributes are more acceptable to consumers. When promoting improved reduced fat dairy products, the industry should emphasize the improved sensory qualities.

The most prominent external factor that influenced the dairy food choices of these women was their family. Health conditions of spouse's were often mentioned as a reason for changing dietary habits. Products that appeal to other members of the household should be developed, for example single serve containers that can be taken for lunch and swirl pudding cups for the children. Advertisements should focus on the fact that dairy foods are good for the family. Emphasis can be on healthy bones and teeth for children and low-fat dairy foods can be emphasized for the spouse with health conditions. Advertisements with mixed age groups, such as a mother and daughter, may appeal to these women. Women also indicated being influenced by media campaigns, such as *Got milk?* and the milk mustache. Women thought that calcium was the major benefit of dairy foods, especially milk. Women were aware that calcium was necessary for strong bones and teeth. Women discussed calcium in relation to milk, while other dairy foods were not mentioned as good sources of calcium. Other nutrients were recognized as important; however, only a few women specified other nutrient such as vitamins A and D. As with calcium, other nutrients were associated with milk but not with other dairy foods.

When discussing nutrition advertisements, women most often discussed television advertisements and magazine advertisements. As a result promotional campaigns, such as magazine advertisements and commercials on television would be an effective method for educating this age group. The dairy industry could also provide flyers and other forms of educational materials in the produce and dairy sections of the grocery store. Posters and billboards would also be an effective method to promote dairy foods.

Results from this study indicate a need for changes in packaging of dairy products to meet the lifestyle of middle aged women. In this study, all but one of the women lived with others; however, women expressed interest in smaller containers for certain products, such as cottage cheese. According to these women, smaller containers were more convenient, but smaller containers were often not readily available. Food manufacturers already produce cottage cheese and yogurt in single serve containers or 8 ounce containers, but perhaps food manufacturers need to expand the distribution of these products to make them available to more consumers. These products could be marketed as convenience items. If products are more convenient and more readily available, women may be more likely to purchase them, which could increase consumption of dairy foods, and also increase women's intake of calcium, vitamin A, and vitamin D. Women also indicated that they preferred milk in opaque containers. Many manufacturers currently package milk in opaque containers; however, those manufacturer's not currently using opaque milk containers should consider changing to opaque containers to meet consumer demands.

When specifically marketing products for middle aged women, focus should be on convenience because the majority of these women indicated convenience was important to them. Many of the women reported that they were employed either part-time or full-time. As a result many of the women indicated they did not purchase foods that required a lot of preparation. The dairy industry might consider developing dairy foods that are ready to use or that are easy to prepare. Women indicated that single serve containers were convenient and easy to pack for lunch. The industry may consider marketing 8 ounce or 16 ounce milk containers as alternative beverages to take for lunch. Women also indicated that they ordered dishes at restaurants that had cream and/or cheese sauces because they did not have time to prepare these items at home. The dairy industry might develop cream and/or cheese sauces that required little or no preparation. The dairy industry should then market these products as convenience items designed for the working woman.

The antacid Tums has been effectively promoted as a calcium supplement as indicated by the large number of women in this study using Tums as a calcium supplement. Those women not using Tums indicated that other calcium supplements were used. The frequent use of supplements suggested that they are sometimes used as replacements for dairy foods. As a result supplements represent competition for the dairy industry; therefore, advertisements for dairy products might emphasize the calcium content.

When discussing restaurants, women indicated areas where restaurants could improve availability of dairy foods. These women expressed an interest in more reduced fat dairy options. Restaurants might consider more low fat dairy options, such as reduced fat cheeses, reduced fat sour cream, skim milk, and ice milk. Restaurants could promote reduced fat options as follows, "Low-fat cheese now available" and "Sensational low-fat frozen yogurt shakes!". Women indicated that milk in restaurants was warm. Women reported that they liked milk best if it was served cold. Women in the groups recommended that restaurants serve milk in chilled glasses and serve milk with the meal, not before that meal. Restaurants could also promote features such as cold milk, "Ice cold milk". Women also indicated that restaurants put too much cheese on food items such as bread sticks. Restaurants might consider having varying amounts of cheese on food items, for example "light cheese", "medium cheese", and "super cheesy".

Lactose intolerance was mentioned in all groups. Women were aware of reduced lactose products, but some women indicated that such products were not readily available. Manufacturers might need to expand the distribution of lactose free dairy foods to make them more readily available to consumers. These products could be advertised in health magazines and women's magazines.

Suggestions for Nutrition Education

Nutrition education programs designed to increase dairy food consumption could be an essential component in preventing osteoporosis. Women identified osteoporosis using terms such as, "brittle bones" and "weak bones". Many of the women felt they were at risk for

developing osteoporosis. These women were aware that calcium, especially calcium supplements and calcium found in milk, is important in the prevention of osteoporosis. However, these women found the information confusing. Women discussed calcium in relation to milk, while other dairy foods were not mentioned as good sources of calcium. Nutrition education programs should continue to emphasize calcium in the prevention of osteoporosis; however, all dairy foods should be emphasized as a good source of calcium. Other nutrients were recognized as important; however, only a few women specified other nutrients such as vitamins A and D. As with calcium, other nutrients were associated with milk but not with other dairy foods. Women should be educated about the other nutrients, such as phosphorus, vitamin A and vitamin D, found in dairy foods.

Women indicated that they consumed a variety of vitamin and mineral supplements. Although women were aware of the calcium in dairy foods, many of them indicated taking calcium supplements for osteoporosis prevention. Many of the women indicated that Tums were used as a calcium supplement; however, other women indicated taking calcium supplements recommended by a physician. Women briefly indicated that physicians influenced dairy food choices, but physicians seemed to play a greater role in influencing supplement use among this age group of women. Physicians need to be educated about the multiple benefits of dairy foods, so that supplementation is not the first recommendation for obtaining adequate calcium. The majority of women indicated that they took calcium supplements because of recommendations from a physician. The prevalent use of calcium supplements make it unlikely that the women were deficient in calcium; however, it indicates that women rely on supplements instead of dairy foods to obtain the calcium they need. By relying on supplements to get the necessary calcium, the women are not receiving the other benefits, such as vitamins A and D, that dairy food provides. Nutrition education programs should address the other benefits of dairy foods and emphasize that supplements cannot provide all the benefits dairy foods provide. Only one group discussed calcium fortified foods, nutrition education programs could address calcium-fortified foods as method to obtain more calcium in the diet. There was evidence that a few women felt that they could not get adequate calcium through dairy foods alone, which motivated them to consume supplements. Nutrition education programs should educate women on ways to consume adequate calcium with dairy foods, so the women do not feel it necessary to consume supplements. The dairy industry and nutrition educators could work together in educating physicians. Promotional campaigns that emphasize the nutrient content of dairy foods and the benefits related to dairy food consumption could be used by the dairy industry to market dairy foods.

Results of this study also indicate that the current emphasis on fat has reached this age group of women as many of the women followed self-prescribed low fat diets. Dairy foods were frequently associated with a high fat content. Women indicated that they used reduced fat dairy products, such as skim milk, regularly; however, women indicated other reduced fat products were often unacceptable. Some women reported they occasionally used reduced fat dairy products, such as cheeses and sour cream. Women also indicated using full fat dairy products, but reported that they used these dairy foods in moderation. Nutrition education programs should continue to emphasize reduced fat dairy foods such as skim milk in efforts to improve dairy food

consumption. If women continue to view certain reduced fat dairy products, as unacceptable, education programs should promote the use of full fat dairy products in moderation. Nutrition educators could work with the low fat theme to promote the use of accepted reduced fat dairy foods, and then educate women to use full fat dairy foods in moderation. In the group discussions, women shared ways they used a combination of regular and reduced fat dairy products. This indicates that some women are knowledgeable about such practices. The other women in the group were receptive to suggestions of this type, which indicates this population is receptive to this type of suggestion. The interaction present in the focus group setting appeared to be effective, as women were willing to share ideas and were receptive to suggestions from other group members. In nutrition education programs, it may be beneficial to allow women to share their ideas with others. These women were responsible for purchasing and preparation of household food, so information should focus on selecting and preparing foods that incorporate dairy foods. Women mentioned nutrition labels infrequently, which indicated women between the ages of 35 and 50 might need to be educated about label reading.

Women expressed concern over food safety issues, such as additives and preservatives used in dairy foods and expiration date of dairy foods. These food safety issues should be addressed in nutrition education programs targeted to this specific population group. These food safety issues were identified as factors that might limit dairy foods consumption. It is important that women were aware of expiration dates as this indicates that women are aware that dairy foods are perishable. Women expressed concern over growth hormones being used to increase milk production. Women feared that these growth hormones were transferred to the milk. A few women indicated that they did not regularly consume milk for this reason.

Women indicated that convenience is important to them. A majority of women indicated that they ate out at least one time per week. Women indicated that many dairy foods in restaurants were high in fat. Many of the women followed self-prescribed low fat diets and indicated that they avoided high fat foods. Nutrition education programs should educate women on how to make food choices in restaurants.

The most prominent external factor in the dairy food choices of these women was their family. Health conditions of spouses were often mentioned as a reason for changing dietary habits. Women indicated that food preferences of spouses and children greatly influenced food choices they made for the household. Therefore, it is important that family members are also educated about the benefits of dairy foods. Women also indicated being influenced by media campaigns, such as *Got milk?* and the milk mustache. When discussing nutrition advertisements, women most often discussed television advertisements and magazine advertisements, which indicates that these media outlets should be used for nutrition education. Television and magazine advertisements could provide brief educational messages in the form of catchy phrases, such as the currently used “milk does the body good”. These sayings are easy to remember and provide a positive belief that milk or other dairy foods are healthy.

The researcher concluded from women’s comments on lactose intolerance and milk allergies that women held misconceptions about milk allergies. Nutrition education should

provide information so women can distinguish between lactose intolerance and milk allergies. It was unclear if this misconception originated with physicians. If this misconception originates from physicians, physicians should be educated about lactose intolerance and milk allergies so that they will be able to pass accurate information about these conditions on to their patients. There are tests available to confirm lactose intolerance. When lactose intolerance is confirmed, the woman could be educated about reduced lactose dairy foods and enzyme tablets to promote continued consumption of dairy foods.

Implications for Research

This study was part of a larger study in which focus groups are being conducted with different generations of educated non-Hispanic white women in Virginia. These focus groups are being used to gather qualitative information about women's perceptions of dairy foods. The qualitative data generated from these focus groups will be used to assist in the design of quantitative research tools such as a questionnaire which will allow researchers to study a larger sample of women to understand their perceptions of dairy foods and how their perceptions influence dairy food choices. This type of information then can be used to help develop dairy products and nutrition education programs that meet the needs of this population of women.

The primary disadvantage of focus groups is that results represent the opinions of a small number of participants and therefore are not generalizable across subset populations (Krueger, 1994). Also, a larger sample of middle age non-Hispanic white women need to be studied before results can be generalized to middle age non-Hispanic white women. Results of this study are relevant only to the factors that influence dairy food choices of educated, non-Hispanic white females ages 35 to 50 living in Virginia. Other middle age populations need to be studied because factors such as educational level, income, and ethnicity may influence dairy food choices. In order to develop nutrition education programs that are relevant and meet the needs of varying populations, it is necessary to study women with different educational levels, minority women, and other subgroups. Focus groups should be conducted with Asian American women because they are the group at second highest risk of developing osteoporosis, and focus groups should be conducted with African American women because they are a group with a significant amount of lactose intolerance. Information gained from these focus groups could then be used to help plan effective nutrition education programs. Research should focus on the perceptions and influencing factors of teenagers, college students, pregnant women, and lactating women. This is necessary because consumption of dairy foods across the lifecycle is necessary for prevention of osteoporosis.

One on one interviews can be conducted to obtain more in depth information about women's perceptions of dairy foods and how those perceptions influence dairy food choices. One on one interviews are time consuming, but they are valuable research tools for gathering in depth information. Research on perceptions and attitudes about dairy foods should also further explore the issue of calcium supplementation. It was apparent that calcium supplementation was common among this group, but research could help determine if women are using supplements to replace dairy foods.

Research, using focus groups, could determine women's perceptions of dairy foods in relation to osteoporosis risk and prevention. Research could also help determine women's understanding of risk factors and prevention of osteoporosis in general.

Convenience was frequently mentioned in these focus groups. Research specifically designed to determine perceptions of convenience in relation to dairy foods would be beneficial to the dairy industry for product development and promotion of dairy foods. Questions should be designed to determine opinions of specific dairy foods in restaurants and home meal replacements.

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APPENDIX A
INFORMED CONSENT FORM

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY INFORMED CONSENT FORM FOR PARTICIPANTS OF INVESTIGATIVE PROJECTS

Project Title: Women's Perceptions of Dairy Products

Principal Investigators: Denise Brochetti, Ph.D. and
Leslie F. Hagy, R.D.

I. PURPOSE OF THE PROJECT

Researchers in the Department of Human Nutrition, Foods, and Exercise are studying women's perceptions of dairy foods. You are invited to participate in this project. Your participation is voluntary.

II. PROCEDURES

You are asked to participate in a focus group discussion of how you feel about dairy foods. There will be approximately 6-10 women participating in the discussion. A moderator will lead the discussion, which will last approximately 1 hour.

III. RISKS

There are no risks involved in this study.

IV. BENEFITS OF THIS PROJECT

Your participation in the project will provide information that may be helpful in understanding how women feel about dairy foods. No promise of benefits has been made to encourage you to participate. When the research is completed, you may contact the investigators for a copy of the results.

V. EXTENT OF ANONYMITY AND CONFIDENTIALITY

The results of this project will be kept strictly confidential. Your name will be removed and only a code number will be used during the evaluation and any written report of the project. Notes will be taken and an audiotape will be made of the discussion. The notes and tape will be reviewed by Leslie Hagy and Carolyn Weiglein, graduate students, and Denise Brochetti, faculty advisor. Notes and tapes will be secured in the office of the Department of Human Nutrition, Foods, and Exercise at Virginia Tech.

VI. COMPENSATION

For your participation, you will receive refreshments at the time of the group discussion.

VII. FREEDOM TO WITHDRAW

You are free to withdraw from this project at any time without penalty. You also have the right to refuse to answer any questions that are asked during the group discussion. If you choose

not to answer any of the questions, you will still be compensated for your participation in the project.

VIII. APPROVAL OF RESEARCH

This project has been approved, as required, by the Institutional Review Board for Research Involving Human Subjects at Virginia Polytechnic Institute and State University and by the Department of Human Nutrition, Foods, and Exercise.

IX. SUBJECT’S RESPONSIBILITIES

I know of no reason why I cannot participate in this study. I have the responsibility of participating in one group discussion of dairy foods.

X. SUBJECT’S PERMISSION

I have read and understand the Informed Consent and conditions of this project. I have had all my questions answered. I hereby acknowledge the above and give my voluntary consent for the participation in this project.

If I participate, I may withdraw at any time without penalty. I agree to abide by the guidelines of this project.

Signature

Date

Should I have any questions about this project or its conduct, I should contact:

Leslie F. Hagy, R.D. (540) 231-7708

Graduate Assistant

Department of Human Nutrition, Foods, and Exercise

Virginia Tech

Carolyn Weiglein (540) 231-7708

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Department of Human Nutrition, Foods, and Exercise

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H.T. Hurd (540) 231-5013

Director, Office of Sponsored Programs

Virginia Tech

PLEASE DETACH AND KEEP THIS PAGE

APPENDIX B
INTRODUCTION AND GROUND RULES

Welcome and Introduction

Welcome to our session today. Thank you for taking time to join in our discussion of dairy food choices. My name is Leslie Hagy and I'm a graduate student at Virginia Tech. We are attempting to gain information on attitudes towards dairy foods and factors influencing dairy food choices.

We have invited you here today because you have certain things in common that are of interest to us. You are all women who are responsible for purchasing groceries and preparing meals. We are very interested in your views because we feel you are representative of other women in your age group.

Today we will be discussing all types of dairy foods, such as different types of milk, cheeses, yogurt, and dairy desserts such as ice cream. As we discuss dairy foods and some of the things that may influence your use of dairy foods, remember there are no wrong or right answers but just different opinions. Please feel free to share your views even if they are different from what others have said. Remember we are interested in negative comments as well as positive comments.

Before we begin, I want to remind you of a few ground rules. Our session will last about 1 hour. We will be tape recording the session so we don't miss any of your important comments. Please speak up and speak one at a time so the tape will be clear. While we are talking, we will be taking notes. We will be using first names but in our reports you can be assured of confidentiality. No names will be associated with your comments.

We will be using name cards to help us remember each other's names. Let's begin.

Modified from examples found in:

Krueger, R.A. 1994. *Focus Groups*. Sage Publications, Thousand Oaks, CA.

Eddy, K.T. 1997. Consumption of dairy foods in educated, older women: use of focus groups to examine attitudes and perceptions.

M.S. Thesis, V.P.I. & S.U., Blacksburg.

APPENDIX C
MODERTOR'S GUIDE

FOCUS GROUP QUESTIONS

1. Opening Statement: Let's begin by going around the room and introducing ourselves. Please say your name and your favorite restaurant [Make a list of restaurants].

2. Introductory Activity: Ranking Exercise

Index cards will be handed out to each participant with the following categories listed:

Convenience
Healthy
Economical
Tastes good

Please give each category a number ranking 1-4 in order of importance to you when choosing foods (1 being most important, 4 being least important).

Categories and directions will also be read out loud.

Lets go around the room again so everyone can share what they ranked as most important and explain what the highest ranked category means to you?

Probes:

Elaborate on why you ranked it highest

What do the categories mean to you

3. Since we are going to be talking about dairy foods, let's make a list of all the dairy foods or foods that contain a lot of dairy you can think of so we can refer to it throughout our discussion. Carrie will be writing it down for us.

Probes:

Consider foods you may eat at home or when eating out

Consider foods you eat as snacks

Can you be more specific about what type of cheese, milk, etc. you are referring to

4. Think back over the last few months. What are some of the dairy foods that you consumed regularly? These can be foods you consumed at home, in restaurants, or with friends. Please give some of the reasons you decided to consume these specific dairy foods. Remember it is fine to disagree with each other, in fact it is expected.

Probes:

Refer them to the list of dairy foods and restaurants

Consider foods you ate at home or when eating out

Consider foods you eat as snacks

Can you be more specific about what type of cheese, milk, etc. you are referring to

Can you be more specific about what you like about the food? [Use if "liking the food" is given as the reason]

5. Let's talk now about some of the dairy foods you seldom or never eat. As you did before,

give some examples and reasons that influence your decision not to eat these foods.

Probes:

Same as probes used for question #4

6. Tell me about dairy foods you order at a restaurant and what influences you to choose these dairy foods.

Probes:

Where do you eat out?

What dairy foods are in the meal?

Think about the foods/dairy foods that are on the menu

What dairy foods are available at the restaurant

Think about the price of some dairy foods at a restaurant

7. What are some of the benefits of dairy foods?

Probes:

Think about the nutrients in dairy foods

What are some of the benefits to you

How important are dairy foods to you

How important are dairy foods in your diet

What are some of your comfort foods and what meanings are attached to these foods

8. What are some of the disadvantages of dairy foods?

Probes:

Refer them back to the list of dairy foods

Refer them back to the factors that influence their food choices

Think about dairy foods in relation to health

9. Think about dairy foods you ate as a child, adult, and when you were pregnant/breastfeeding. What were some of the changes you made in your food choices?

Probes:

Why did you make these changes

What influenced you to make these changes

Were the changes permanent or temporary

How satisfied were you with these changes

10. Describe some situations as you age that may influence you to change the dairy foods you regularly eat.

Probes:

What changes would be made

What were some of the factors that would influence this change

Think about menopause

Has anyone thought about making changes already, what are some of the reasons for the changes

11. How do you think the food industry could improve dairy foods to make them more

desirable to you and your family or friends? [Have them elaborate on suggestions]

Probes:

Refer them to the list of foods and factors that influence food choices

Have you tried some of the new dairy foods such as low fat versions

Do you think the packaging could be improved to be more convenient

Could the packaging be improved to make foods more appealing

What type of product are you referring to

Is it a product you would buy regularly

What would you like to see developed

12. What could the dairy industry do to improve dairy foods in restaurants?

Probes:

Think about availability, variety, and price

13. We've talked about suggestions to improve existing products. Are there any suggestions for a totally new product?

14. What does osteoporosis mean to you?

Probes:

Can you define osteoporosis?

15. Do you think you're at risk for developing osteoporosis?

Probes:

Think about family members with osteoporosis (grandmother, mother, or aunts)

Does the risk of osteoporosis influence what you eat

16. If you take calcium supplements, what do you see as some of the benefits of the calcium supplements?

Probes:

Tell me more about the supplements that you take.

Think about the cost of the supplements

Is it a multi-vitamin

Why did you start taking the supplement

Did you start taking the supplement on your own or did a physician recommend you start the supplement

17. Can you think about some of the dairy advertisements. Tell me about them and what the advertisements say to you. Does the advertisement influence you?

Probes:

Think about television and magazines

Show them some examples of advertisements

Milk Mustache campaign

Got milk?

Dannon yogurt with added calcium

Osteoporosis poster

18. Closing Activity: How much dairy did you eat yesterday?

Food	Number of Servings
8 ounces of fluid milk	
8 ounces yogurt	
½ cup ricotta cheese	
10 ounce milkshake	
2 slices processed cheese	
1 ounce hard cheese	
1/3 cup grated cheese	
1 cup frozen yogurt	
1 cup cottage cheese	
½ cup softserve vanilla ice cream	
½ cup pudding	
1 slice medium cheese pizza	
1 medium cheeseburger	

Modified from examples found in:

The American Dietetic Association's Calcium in Your Life: Up-to-Date Tips from the World's Foremost Nutrition Experts, Colleen Pierre, MS, RD, Chronimed Publishing, 1997.

Virginia Cooperative Extension's Calcium Checklist -Food Guide Pyramid, Ann Hertzler, PhD, Publication 348-019, 1995.

19. Is there anything else you'd like to add that we have not discussed here today?

Revised from questions developed by Eddy (1997)

APPENDIX D
SOCIODEMOGRAPHIC QUESTIONNAIRE

PLEASE PROVIDE THE FOLLOWING INFORMATION:

Do you live alone? Yes No

If no, whom do you live with _____

Number of other people in the household _____

Do you work? Yes No

If you work, do you work: Full-time

Part-time

Occupation _____

How often do you usually do the grocery shopping in your home?

Never

Sometimes

Almost Always

Always

How often do you usually prepare meals for yourself and/or your family?

Never

Sometimes

Almost Always

Always

How often do you usually eat out (either breakfast, lunch, or dinner)?

Never

Less than 1 meal per week

1 meal per week

More than 1 meal per week

Do you follow any of these diets?

No Yes

If yes, please check all that apply:

Low fat

Low cholesterol

Low salt (sodium)

Low calorie (weight loss)

Diabetic

Other, please explain _____

Do you follow a vegetarian diet?

No Yes

If yes, please list the foods you exclude from your diet:

Please check the highest level of education obtained:

- Vocational or technical school
- Associate degree (Community college)
- Some college
- B.S. or B.A. degree
- Graduate degree
- Other: _____
- Don't care to answer

Age:

- Less than 35
- 36-40 years
- 41-45 years
- 46-50 years
- 51+ years
- Don't care to answer

Do you currently take any vitamin and/or mineral supplements?

- Yes No

If yes, what supplement(s) do you take _____

APPENDIX E
CHRONOLOGICAL PLAN FOR STUDY

CHRONOLOGICAL PLAN

ACTIVITY	DATE
Complete 2 pilot studies with target groups and revise focus group questions and procedures	December 1, 1997
Recruit subjects for focus groups	January 1 to April 30, 1998
Conduct four focus groups with target groups; transcribe focus group tapes	January 1 to April 30, 1998
Analyze transcripts of focus groups	April 30 to May 30, 1998
Interpret data analysis and write thesis	June 1 to August 17, 1998

APPENDIX F
LETTER SENT TO POTENTIAL FOCUS GROUP PARTICIPANTS

[OFFICIAL LETTERHEAD]

[Date]

[Name and address of participant]

Thank you for accepting our invitation to attend a discussion at _____ in _____ on _____
_____. The meeting will begin at ____ and conclude around _____.

A limited number of people will be attending the discussion, and the success and quality of the discussion will depend on the cooperation of the people in attendance. Your attendance at the discussion will aid in making this research project a success.

The discussion you will be attending will be a forum of women between the ages of 35 and 50. We will be discussing perceptions and attitudes of dairy foods and how these perceptions and attitudes influence dairy food choices. We would like to get your opinions on this subject. This is strictly a research project, and no sales or solicitations will be made. At the conclusion of the session there will be drawings for door prizes.

If for some reason you will be unable to attend, please call us and let us know as soon as possible. Our phone number is (540) 231-7708.

We look forward to seeing you there.

Sincerely,

Leslie F. Hagy
Forum Moderator

Modified from examples found in:
Krueger, R.A. 1994. *Focus Groups*. Sage Publications, Thousand Oaks, CA

APPENDIX G
LIST OF DAIRY FOODS

Dairy Foods

Whole milk	Cream	Cream soups
2% milk	Half-and-half	Cream sauces
1% milk	Whipping cream	Butter
½% milk	Hot chocolate	Cream cheese
Skim milk	Sherbet	
Lactose reduced milk	Cheese soufflé	
Sweet acidophilus milk	Blue cheese	
Chocolate milk	Brie cheese	
Yogurt, regular, low-fat, fat-free	Camembert cheese	
Milkshake	Cheddar cheese	
Frozen yogurt	Limburger cheese	
Cottage cheese	Mozzarella cheese	
Ice milk	Parmesan cheese	
Ice cream, regular, low-fat, fat-free	Provolone cheese	
Pudding with milk	Ricotta cheese	
Evaporated milk	Swiss cheese	
Sweetened condensed milk	American cheese	
Dry milk powder	Feta cheese	
Buttermilk	Au gratin potatoes	
Sour cream	Macaroni and Cheese	

VITA

Leslie F. Hagy, R.D.

Leslie F. Hagy was born in Richlands, Virginia on January 23, 1972. After graduating from Tazewell High School in Tazewell County, Virginia, she began her undergraduate studies at James Madison University in Harrisonburg, Virginia. In 1994, she received a Bachelor of Science degree in Dietetics. She completed her dietetic internship at Ruby Memorial Hospital in Morgantown, West Virginia and passed the dietetic registration exam in 1995. She was employed by Aladdin Food Management, Inc. and worked as a clinical dietitian at St. Joseph's Hospital in Buckhannon, West Virginia from August 1995 to August 1996. She began her graduate program at Virginia Polytechnic Institute and State University in 1996. Her Master's of Science degree in Human Nutrition, Foods, and Exercise and a Certificate in Gerontology were awarded in December of 1998. She is a member of the following honor societies: Golden Key National Honor Society, Order of Omega, and Sigma Phi Omega. She is also a member of the following professional organizations: The American Dietetic Association, Virginia Dietetic Association, Gerontological Society of America, The National Council on the Aging, and Virginia Association on Aging. She is currently the Director of Dietary at NHC HealthCare in Bristol, Virginia.