

**Using Focus Groups to Determine Blue-Collar Workers'
Perceptions Regarding Dietary Practices and Cancer Prevention**

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(ABSTRACT)

Recent nutrition reports conclude that changing dietary practices is a strategic way to reduce cancer rates in the United States. Nutrition recommendations to decrease risk of cancer include reducing fat intake to 30% of total calories, increasing fiber consumption to 20-30 g/day, and increasing fruit and vegetable consumption to five servings daily. However, recent studies suggest that fruit and vegetable consumption decreases with educational and income levels within a population, and that blue-collar workers tend to consume 38-40% of total calories as fat. It is possible that national campaign efforts to change dietary practices are not reaching educationally and economically challenged populations.

This research identifies the perceptions of blue-collar workers regarding a link between dietary practices and disease prevention. Six focus groups, three of women and three of men were conducted in urban, suburban, and rural Virginia counties. A total of 66 workers participated, and each group was comprised of 8-16 blue-collar workers 35-65 years of age.

Most participants were aware of a link between dietary practices and health. A “healthy person” was described as eating low fat foods, fruits and vegetables, and maintaining a healthy weight. Fatty meat consumption, food processing, and chemical treatment of food were perceived as increasing risk for disease. Few participants were aware of a potential link between diet and cancer. Many contributed risk for cancer to factors beyond their control such as heredity, environmental factors, and the influence of the food industry. Those who had experienced a disease, either themselves or through a loved one expressed a greater sense of urgency to modify their eating habits. Most of those attempting dietary modification were addressing health issues relating to cardiovascular disease. The majority reported consuming less than five servings of fruits and vegetables daily, most often as canned or frozen products.

Participants reported receiving nutrition education from non-interactive sources, such as television, newspapers, magazines, and radio, and interactive sources such as health professionals and community programs. Those that mentioned interactive sources were more likely to elaborate on specific information learned. Television segments, newsletters, and worksite programs were selected as the most preferred ways to receive nutrition education. When asked what topics would be most helpful in a newsletter series, people requested information regarding heart disease more frequently than cancer. Health benefits of fruit and vegetable consumption, menus, and recipes were also mentioned.

The findings suggest that nutrition education efforts concerning cardiovascular disease have penetrated the blue collar population. Community educators need to broaden messages to include current information regarding the potential link between dietary practices and cancer. Furthermore, 35-65 year olds may exhibit more willingness to change dietary habits through nutrition education due to changes in health among themselves or loved ones.

Dedication

I dedicate this thesis to my family. A long journey begins with one step...thanks for the lift!

To my husband-

A hero is one who knows how to hang on one minute longer (*Norwegian Proverb*).

Thanks for your patience and support. You are my hero.

To Mom and Dad -

One loving family is more than a fair share. I am blessed to have two.

To my Mother-

You made me who I am, and I am happy.

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CHAPTER I: INTRODUCTION

Rationale and Purpose of the Study

Cancer is the second leading cause of death in the United States (U.S. Dept. of Health and Human Services [U.S. DHHS], 1988). The lifetime risk of developing cancer in the United States (U.S.) is one in two for men and one in three for women (World Cancer Research Fund [WCRF], 1997). Currently, it is estimated that approximately 8.4 million Americans have a history of cancer, and over one million more cases are expected to be diagnosed within one year (American Cancer Society [ACS], 2000).

Cancer rates rose steadily in the U.S. by 1.2% per year from 1973 to 1990 and finally declined 0.7% from 1990 to 1995 for both men and women as well as most age groups and ethnic groups (National Institutes of Health [NIH] & National Cancer Institute [NCI], 1998). This decline indicates that efforts to curb rising cancer rates are beginning to be effective. However, despite the decrease in incidence, prevalence is still high, and cancer prevention efforts need to continue if incidence is to continue declining.

Sharp increases in the incidences of lung and breast cancer, as well as a decrease in the incidence of stomach cancer suggest that lifestyle factors play an important role in disease occurrence (Frazão, 1999), and epidemiological research suggests that cancer is not an inevitable result of aging (WCRF, 1997). Some dietary habits have been strongly correlated with increased risk for cancer (WCRF, 1997). In 2000, researchers estimated that as many as one-third of all cancer deaths were attributable to dietary habits accounting for over 186,000 cancer deaths in the United States (ACS, 2000). The National Research Council (NRC), the ACS, and the NCI continually reviewed results from studies conducted during the past half century and have concluded that changing dietary practices is a strategic way to reduce cancer rates in the United States (WCRF, 1997). While implicated dietary causes of cancer are numerous, overall dietary patterns of micro and macronutrient consumption appear to be more important factors than the ingestion of carcinogens (Doll & Peto, 1981). Specifically, high intakes of dietary fat and low consumption of fiber, fruits, and vegetables have been correlated with increased risk for cancer (WCRF, 1997). Nutrition education recommendations to decrease risk of cancer have included reducing fat intake to 30% of total calories, increasing fiber consumption to 20-30 g/day (Greenwald & Sondik, 1986), and increasing fruit and vegetable consumption to 5 servings daily (U.S. DHHS, 1992).

Worldwide, the average quantity of fat consumed increases with economic development as prepared food containing added fats and oils are more available (WCRF, 1997). The standard American diet from the 1960's to the present has been characterized by increasingly high intakes of added fats, meats, alcohol, dairy foods, and sweeteners. As a result, discrepancies between national dietary recommendations and actual dietary practices have been identified. Fat consumption in the U.S. supplies between 30% and 45% of total energy (WCRF, 1997). Increasing evidence of the link between fat consumption and disease, and changes in national dietary recommendations based on this evidence caused a drop in average fat consumption from 41% of energy in 1977 to 34% of energy in 1993 (WCRF, 1997). While the national average consumption has decreased, fat consumption continues to remain well above national recommendations for certain populations. For example, recent studies of blue-collar workers found fat intake to be between 38% and 40% of total calories (Betts & Foote, 1985, Emmons, Marcus, Linnan, Rossi, & Abrams, 1994).

Although average fat consumption in the U.S. has fluctuated over the past few decades, consumption of fruits and vegetables has remained relatively constant. Consumption patterns of fruits and vegetables in the U.S. are similar to those in most of the world at about 5% or less of energy intake (WCRF, 1997). While estimated consumption of fresh fruits and vegetables rose 17% between 1970 and 1990, national surveys have shown that intake remains below the recommended 5 servings daily (Dittus, Hillers, & Beerman, 1995, Havas, Heimendinger, Reynolds, et al., 1994). Only 23% of the adult sample population were consuming recommended levels in a 1991 survey (Havas et al., 1994). Furthermore, research has consistently revealed that as income and educational level decrease within a population, people are less likely to perceive that increasing fruit and vegetable consumption is beneficial to health, and more likely to perceive barriers to consuming recommended intakes (Patterson, Kristal, Lynch, & White, 1995, Dittus, et al., 1995, Harnack, Block, Subar, Lane, & Bland, 1997). These results suggest that populations with limited income and education most likely fall short of national dietary recommendations, are at increased risk for diseases such as cancer, and are in need of nutrition education programs.

As cancer rates remain high and discrepancies between national dietary recommendations and actual dietary practices have been identified, researchers have

speculated that low intake of fruits and vegetables is the dietary risk factor most strongly associated with an increased risk of developing cancer (Havas, Heimendinger, Damron, et al., 1995). Many nutritive and non-nutritive components of fruits and vegetables have been identified to be potentially protective against cancer (Steinmetz & Potter, 1991). In addition to providing numerous benefits from cancer protective agents, increasing fruits and vegetables in the diet may serve to replace, and consequently lower dietary fat intake to meet national recommendations. Therefore, national nutrition education campaigns have been developed to encourage Americans to modify their dietary practices by reducing consumption of dietary fats and increasing consumption of complex carbohydrates through fruits and vegetables (Havas et al., 1994).

In conjunction with national nutrition education efforts, education at the community level is essential to influence a wider variety of audiences, provide messages more tailored to specific population needs, and to increase long-term effectiveness of the messages through continued exposure (Contento, 1995). Heimendinger (1993) has described the use of national objectives to develop community level interventions as “channeling.” Nutrition educators need to develop and implement research-based intervention programs and educational tools that clearly, simply, and effectively convey ways to meet dietary recommendations by making desirable behavior changes. Thus, the NCI must rely on cooperative efforts with government agencies to help reach a greater scope of the public with educational messages.

Cooperative Extension agencies are funded and administered jointly through the USDA and land grant universities, and are responsible for the development and implementation of community outreach educational programs. Nutrition education intervention efforts by Extension agents target different levels of audiences with education intervention programs. Historically, interventions for adults have been most often directed at the individual level which includes one-to-one counseling, group classes, and distribution of printed self-help materials (Contento, 1995). Since the early 1900’s, Cooperative Extension has seen positive results from providing short, concise, and accurate printed educational information to the community (Breckon, Harvey, & Lancaster, 1994). However, there has been limited research and consensus on how to develop interventions at the community level that are effective in promoting changes in dietary behavior (Patterson, Kristal, & White,

1996, Kristal, 1993). There is a need for nutrition educators to research and plan intervention strategies designed to address target populations with dietary habits that place them at higher risk for cancers.

In 1994, 47% of all cancer deaths were individuals 55-74 years of age, and 40% of cancer deaths were individuals 75 years and older (Singh, Kochanek, & MacDorman, 1996). This suggests that older adults may make an appropriate audience for preventive interventions. This study investigated the most effective way to provide blue-collar workers with educational information regarding the link between dietary practices and risk of cancer in order to improve their health and quality of life. The primary purpose was to assess perceptions of blue-collar workers regarding the link between dietary practices and overall health; current recommendations for a low fat, high fiber diet; barriers and benefits to increasing the consumption of fruits and vegetables; daily diet and health routines; and useful nutrition educational strategies to improve dietary habits. In the future, the effectiveness of the resulting educational materials developed from the results of this study will be further evaluated.

Research Questions

1. To what extent are blue-collar workers aware of the link between dietary practices and health?
2. To what extent are blue-collar workers aware of current recommendations for consuming a low fat, high fiber diet?
3. What do blue-collar workers perceive as barriers and benefits to consuming a low fat, high fiber diet?
4. What are the daily food and health routines of blue-collar workers?
5. What type of educational strategies do blue-collar workers perceive as useful regarding how they can change dietary behavior to decrease cancer risks?

Definitions

Blue-Collar Workers : Members of the working class defined as holding industrial or factory type positions with limited opportunity for advancement, generally limited incomes, and limited educational backgrounds.

Limited Income : A state in which income level generally remains above poverty level, yet is somewhat fixed, tends to increase only with cost of living and thus, remains limited.

Limited Education: Educational level may or may not include completion of high school, may include special trade or vocational training, may include some junior college or college, but generally does not include completion of a four year degree or higher.

CHAPTER II: REVIEW OF THE LITERATURE

The review of the literature relevant to this project begins with a discussion of the relationship between nutrition and cancer and the impact of general nutrient intake patterns including fats, fruits, and vegetables on cancer prevalence. What follows explains the rationale behind national recommendations for dietary intakes and examines the relationship between recommended intakes and actual dietary practices of certain populations. The role of national and community based nutrition education interventions to change dietary practices in certain populations is discussed. Finally, in an effort to design interventions that are perceived as useful, ways to utilize research findings in conjunction with theories of behavior change are examined.

Dietary Habits and Cancer

As early as 1964, researchers recognized a correlation between dietary practices and the incidence of cancer (Doll & Peto, 1981). As recent as 1997, a report compiled by the World Cancer Research Fund (WCRF) and National Institute for Cancer Research (NICR) published research findings that suggest fruits and vegetables in the diet reduce the risk of most, if not all, cancers. Cancer is presumed to be preventable when it stems from certain behavioral and environmental factors that are considered avoidable such as tobacco use, sun exposure, environmental pollutants, and dietary habits (Doll & Peto, 1981). In 1981, it was estimated that dietary habits were responsible for more cancer cases than tobacco, alcohol, sunlight, occupation, and other unknown causes combined (Doll & Peto, 1981). Though statistical estimates of the connection between diet and cancer over the past decade have varied, the correlation between diet and cancer has remained strong. The most recent reports from the American Cancer Society (ACS) suggest that one third of all cancer deaths are related to dietary habits (ACS, 2000).

Several dietary factors have been identified as cancer promoting agents including high consumption of calories, fats, alcohol, nitrites, and other mutagenic compounds (WCRF, 1997). On the other hand dietary factors such as low calorie intake, dietary fiber, vitamins, carotenoids, antioxidants, and phytochemicals have been found to have protective roles against cancer (Steinmetz & Potter, 1991). While the mechanisms of most identified mutagens and many cancer protective agents are known, the effect macronutrient intake patterns have on cancer is not entirely clear.

Fat Consumption

Of the nutrient intake patterns associated with increased cancer risk, evidence suggests total caloric and fat intakes play a crucial role. Research has shown that tumor growth is slowed on a calorie-restricted diet, and restricting calories from fat in particular appears to be of importance in this mechanism (Kritchevsky & Klurfeld, 1991). In addition, tumor incidence in tumor-induced rats was significantly lower on a fat free diet as compared to a high fat diet. Obese humans have a higher incidence of many tumors (Kritchevsky & Klurfeld, 1991), and total fat consumption has been positively correlated with lung, breast, prostate, and colorectal cancers (WCRF, 1997). Type of dietary fat intake appears to be of importance as little to no evidence exists linking monounsaturated and polyunsaturated fat intakes to risk of cancers. Most data on fat consumption and risk of cancer implicates saturated fats as the link. Data suggests that the excess caloric contribution from intake of a high fat diet may be responsible (Kritchevsky & Klurfeld, 1991).

A study of nutrient intakes of 200 male and female blue-collar workers in 1985 revealed that fat consumption was approximately 38% of total calories due to high intakes of high fat meats and whole milk in conjunction with low intakes of fruits and vegetables (Betts & Foote, 1985). Almost a decade later, another study where 62% of the sample was comprised of blue-collar workers showed little change (Emmons et al., 1994). In an analysis of a Food Habits Questionnaire regarding dietary fat intake in this study, the relationship between readiness to reduce dietary fat intake and actual fat intake was examined. For individuals in the earliest stages of attempting to change their dietary habits, fat intake was very high at 41% of total calories. Even those who considered themselves to be in the action or maintenance stages of dietary behavior change had fat intakes at 37% of total calories which was still 7% higher than national recommendations (Emmons et al., 1994).

Fruit and Vegetable Consumption

Research has yet to produce any studies of human feeding trials testing the effects of fruit and vegetable ingestion on risk of developing cancer (WCRF, 1997). However, the roles of individual cancer preventive agents in the diet have been studied extensively. Thus far these agents have included vitamins A, C, E, and folate, carotenoids, fiber, dithioliones, flavenoids, glucosinolates, indoles, isothiocyanates, phenols, d-limonene, and allium compounds, all of which are found in plant foods (Steinmetz & Potter, 1991). As early as the

1930's, results from epidemiological studies showed that fruit and vegetable consumption decreased the risk for developing cancer (WCRF, 1997). In a recent review, fruit and vegetable consumption was found to be significantly protective against cancers of the digestive and respiratory tract in 128 of 156 studies. Low consumption of fruits and vegetables at least doubled the risk of developing cancer in these studies (Block, Patterson, & Subar, 1992), and epidemiological evidence suggests that of all the dietary risk factors, it is most strongly associated with increased risk of developing cancer (Havas et al., 1995). A recent review of approximately 200 studies suggests that increasing fruit and vegetable consumption is associated with a decreased risk of developing cancers of the pharynx, esophagus, oral cavity, stomach, pancreas, colon, rectum, larynx, lung, bladder, endometrium, cervix, and ovary (Steinmetz & Potter, 1991).

Dietary Behavior Patterns in the U.S.

Despite the overwhelming evidence of the protective effects fruits and vegetables have against cancer, consumption in the U.S. has not risen enough to meet national recommendations. Results from a 24-hour recall in the National Health and Nutrition Examination Survey II (NHANES II) reported 45% of the adult sample population had not consumed any fruit servings in 24 hours, and 22% had not consumed any vegetables (Patterson, Block, Rosenberger, Pee, & Kahle, 1990). A telephone survey conducted by the National Cancer Institute (NCI) in 1991 to gather information about fruit and vegetable consumption indicated that only 23% of American adults were consuming the recommended intake before the start of a national campaign designed to increase fruit and vegetable consumption. A two-year follow up survey in 1993 indicated that the number of Americans aware of the need for increased fruit and vegetable consumption rose 21%, and the number of people who believed increased consumption would help to prevent cancer rose 19%. However, the follow up survey showed a 5% increase from the baseline survey in those who viewed a goal of consuming five servings a day as "very hard" to accomplish (Contento, 1995).

The discrepancy between actual and recommended intakes of fruits and vegetables has resulted in several studies attempting to identify patterns of knowledge, attitudes, and beliefs contributing to the lack of fruit and vegetable consumption. Results have suggested that a discrepancy exists between knowledge of the diet-cancer relationship and actual

dietary practices and beliefs. Data from the Cancer Control Supplement of the 1987 National Health Interview Survey (NHIS) revealed that only about half of those surveyed felt a person could do something to reduce their risk of cancer. This was incongruent with the fact that 90% of the NHIS respondents believed that diet and disease were related, and that 73% knew diet and cancer were related (Cotunga, Subar, Heimendinger, & Kahle, 1992). Furthermore, only about 40% selected poor eating practices from a list of items when asked which ones they thought increased their susceptibility to cancer. Krebs-Smith et al. (1995) found similar results in a 1991 telephone survey of 2811 adults across the U.S. While 40% of respondents believed that eating fruits and vegetables was likely to prevent cancer, only 30% had made it a habit to increase consumption since childhood, and only 8% believed that a person should have five or more servings a day. These results suggest that, while people are likely to know that a correlation between diet and cancer exists, they lack ideas on how to translate this knowledge into cancer preventive dietary practices (Cotunga et al., 1992), or perceived barriers are more influential than knowledge towards behavior change.

In fact, previous research has suggested that a strong link exists between perceived barriers and behaviors, and therefore researchers have sought to identify barriers to fruit and vegetable consumption (Eisner, Loughrey, Hadley, & Doner, 1992, Cotunga et al., 1992). Cost, availability, disbelief that vegetables help prevent cancer, concern about agrichemicals, family acceptance, and inability to prepare fruits and vegetables have all been identified as barriers to increasing consumption. In one study it was thought that barrier perceptions might have been strong enough to diminish concern regarding the link between cancer and diet (Dittus et al., 1995). Harnack et al. (1997) also concluded that perceived barriers might cause dietary behaviors to be less influenced by a person's existing knowledge and beliefs. Research conducted by Glanz, Basil, Maibach, Goldberg, and Snyder (1998) to investigate the importance of certain factors on food consumption suggested that taste and cost are, in fact, more relevant than nutritional concerns. Ultimately, it appears that nutrition knowledge and attitudes may not predict behavior as strongly as perceived barriers. Dittus et al. (1995) have suggested that diminishing perceived barriers, while promoting perceived benefits, may be an effective tactic to change an individual's behavior regarding fruit and vegetable consumption. Thus, providing a population with strategies to overcome perceived barriers may be most effective in influencing behavior.

When results from surveys of attitudes, beliefs, and behavior were analyzed demographically, they revealed that these factors vary among populations. Consequently, different populations may have different educational needs. For example, results from the 1987 NHIS showed that people with lower income and educational levels were more likely to feel that diet had little impact on disease, though the difference was not drastic (Cotunga et al., 1992). However, other studies have suggested a significant relationship between education, income, and cancer-preventive dietary practices. Patterson et al. (1995) obtained results similar to the 1987 NHIS in a survey of over 1900 adults which found that less educated adults were less likely to identify cancer preventive foods. More specifically, it has been shown that those with a high school education or less and incomes below 130% of the poverty level were least likely to view five or more servings of fruits and vegetables per day as beneficial towards health (Krebs-Smith et al., 1995). Other studies have identified adult men and individuals with less education as eating fewer fruits and vegetables than recommended, and results have shown that survey respondents with lower income and less education perceived significantly more barriers to fruit and vegetable consumption (Dittus et al., 1995). Harnack et al. (1997) found that low educational levels consistently predicted that perceived barriers diminished the impact of pre-existing knowledge and beliefs on dietary practices.

As surveys of knowledge, attitudes, and beliefs have indicated, a need for educational strategies to increase fruit and vegetable consumption exists. However, the research also implies that increasing knowledge with informative educational techniques may be an insufficient strategy in some populations. Cotunga et al. (1992) have pointed out that while the general public can benefit from education interventions, groups with lower income and less education appear to exhibit greater needs for information to assist behavior changes.

Populations of low income and educational levels need to be targeted for educational intervention with regards to improving consumption of fruits and vegetables, but the beliefs and perceptions of this population regarding this issue are poorly understood. Consequently, preferences as to the type of information that should be included in educational materials are not clear and may vary according to the target population. Since both informational needs and perceived barriers vary according to lifestyle and economic status within a specific population, there is a need for nutrition education research to identify beliefs, perceptions,

and preferences regarding what type of nutrition information is useful when designing nutrition education interventions specific to limited income and education groups.

National Intervention

One of the goals in “Healthy People 2000” (HP 2000) developed by the U.S. DHHS is to reduce cancer rates by 25-50% by the year 2000. In an attempt to meet these goals, the current recommended intake of fruits and vegetables has been established by the USDA, the DHHS, and the National Academy of Sciences as 5 servings daily (U.S. DHHS, 1992). The NCI established the “5 A Day for Better Health” campaign in 1991 to encourage Americans to meet the recommended intake.

The 5 A Day campaign bases its strategy on the social marketing theory and attempts to consider many variables of the nutrition education process including cultural sensitivity, consumer attention span, and simplified messages. Developed from results of focus group research and the stages of change model (Contento, 1995), it has combined the impact of the media with community-based education programs (Havas et al., 1995) to target adults who were already consuming a significant amount of fruits and vegetables as most likely to increase their consumption (Contento, 1995). Consequently, NCI surveys two years after the start of the campaign in 1991 showed a 21% increase from baseline of Americans who were aware that five or more servings of fruits and vegetables a day could result in better health, and a 19% increase in the number of Americans who believed five servings of fruits and vegetables daily may help prevent cancer (Contento, 1995).

As a mass media intervention directed at society at large, the campaign has made a significant impact resulting in increased awareness and knowledge which is often viewed as the first step of behavior change (Contento, 1995). However, the continuing discrepancy between actual and recommended intakes of fruits and vegetables revealed that, while the message is changing knowledge and beliefs in some populations, it is not necessarily changing behavior. This suggests there are other obstacles to increasing fruit and vegetable consumption besides knowledge that need to be addressed. Thus, in order to effectively meet HP 2000 goals, there is a need for continuing nutrition education beyond mass media efforts.

Community Interventions

Mass media health education programs are based on clinical and epidemiological evidence and can effectively increase knowledge and awareness as well as increase cost

effectiveness of education efforts. However, these messages are designed to clearly and concisely present the facts, and it is unlikely that this information alone will lead to the desired behavior change (Sutton, Balch, & Lefebvre, 1995). In addition, efforts such as the 5 A Day campaign are based on the results of focus group research, and it is likely that they are most influential on the population they are designed to target. Thus, national campaigns are limited to influencing only certain populations to a certain extent. Furthermore, research by Thompson et al. (1999) revealed significant variability in fruit and vegetable consumption according to geographic region, age, educational level, race, and marital status. Therefore it is important to consider modifying nationally focused interventions according to these factors in order to tailor interventions to the site (Havas et al., 1994).

While epidemiological and clinical research help define mass media messages regarding recommended health behaviors for the general public, community and consumer research are necessary to develop effective strategies to implement public messages at the community level intended to target a specific audience. More specifically, this involves adequately understanding factors present in a target population such as level of knowledge, attitudes, beliefs, values, desires, needs, and behaviors. Once such perceptions are understood, they can be applied to theoretical models of behavior change in order to develop behavioral change strategies that are more likely to be perceived as useful, and ultimately more effective. This process helps educators understand a population's reality and makes intervention programs relevant to the target population (Sutton et al., 1995).

Utilizing Theories of Behavior Change and Intervention Strategies

Behavior change is a complex process influenced by many variables including knowledge, attitudes, beliefs, and perceptions. In a 1995 review of the research regarding the effectiveness of nutrition education, Contento et al. state that educational programs are more effective when based on prior research and behavioral theory. In essence, research seeks to identify the most appropriate behaviors to address by identifying the needs, perceptions, motivations, and desires of the target audience. Programs can then be effectively designed to target those behaviors using a combination of proposed behavioral change models. In their report, the researchers summarize useful behavioral change models, which included the stages of change model, the knowledge-attitude-behavior (KAB) model, and the social-learning theory (SLT). What follows is a brief synopsis of how information obtained from

consumer research efforts may be applied to develop tailored educational interventions and programs using these theories.

The stages of change model illustrates the complexity of behavior change in a simplified format describing processes of pre-contemplation, contemplation, preparation, action, maintenance, and termination (Contento et al., 1995). While all education interventions may not be influential enough to elicit a complete change in behavior, they may be influential in promoting an audience to a new stage of the process. For instance, providing printed educational information in a personalized format, with a self-assessment of dietary status in comparison to recommendations for nutrition intake, has been shown to enhance motivation in adults (Contento, 1995).

Nutrition education research has indicated that implementing intervention programs to effectively provoke the behavioral change process depends on the type of information that is relayed (Contento, 1995). Therefore, it is necessary to first determine what type of information a target audience will find useful, and how the information will be most effectively presented so that the educational information is actually perceived as useful. If written material provides information that is perceived by the audience as useful, it will be more successful in influencing behavior (Breckon et al., 1994). For instance, according to the KAB model of behavior change, “awareness” knowledge and knowledge of “anticipated consequences” are classified as motivational knowledge which enhances motivation to take action. However, “how-to” knowledge and “behavioral capabilities” knowledge are classified as instrumental knowledge that encourages people who are already motivated to act (Contento, 1995). In essence, while both types of knowledge are necessary to implement behavior change, regard for audience perceptions and attitude is essential when considering the timing and type of information presented. More specifically, instrumental knowledge presented to the unmotivated audience may be perceived as “just information,” whereas the same information presented to the motivated audience may be the link necessary for behavior change.

The social learning theory (SLT) provides a framework in which a person’s “perception of the environment, anticipated outcomes of behavior, knowledge and skills to perform the behavior, and confidence in performing the behavior” all contribute to behavioral change outcome (Contento et al., 1995). Thus, the knowledge, attitudes, beliefs,

and perceptions obtained from researching a target population can reveal insight about deficits in knowledge and skills, perceived roles of environmental factors influencing the behavior, and confidence to perform the behavior. This insight can subsequently be used to tailor intervention information. For instance, if consumer research reveals that a population believes that fruit and vegetable consumption improves health, but they do not feel they know how to prepare them, educational efforts can focus on preparation methods taking into consideration barriers, such as time, cost, and availability.

Two other related concepts described in this theory are “self-efficacy” and “health locus of control” (Strecher, DeVellis, Becker & Rosenstock, 1986). Self efficacy describes a person’s beliefs about personal capabilities to undertake a behavior (Strecher et al., 1986). Thus, it reflects the ability or inability to perform a behavior in the face of obstacles or barriers. Health locus of control describes whether or not a person believes their health is controlled by personal behaviors or by factors beyond their control (Strecher et al., 1986). For instance, if a person believes that environmental factors are more influential than dietary habits in determining their risk for cancer, the perceived locus of control is described as external. Interventions can be designed to clarify such beliefs. If perceptions concerning external health locus of control are misconceptions, clarification can lead to an improved sense of self-efficacy. In essence, if an intervention targets both barriers to a behavior and misconceptions concerning health locus of control, self-efficacy is improved and the likelihood of behavior change is increased.

Applying behavioral theory to research findings can ultimately provide a template for intervention topics and presentation format. Once information about what to include in the intervention is obtained, the mode of delivery must also be considered in tailoring an effort. Different community intervention strategies may be more appropriate for specific populations, and should be planned according to consumer research findings as well as socioeconomic factors. For example, the fact that more than 60% of adults between the ages of 18 and 65 years are employed, as well as the large amount of time most Americans spend in the workplace make worksite intervention programs an important part of strategies to target individuals of limited income and education (Havas et al., 1995). Since most employees consume at least one meal during work hours, nutrition interventions can focus on changing dietary habits for at least one meal per day. Furthermore, they can target large

groups and remain implemented long enough for follow up periods to reinforce messages over time (Glanz & Eriksen, 1993). In addition, newsletters are a low-cost approach to education, can be easily utilized in conjunction with worksite programs, and have been found to significantly increase fruit and vegetable consumption in adults (Lutz et al.,1999).

In a review of the literature concerning worksite intervention programs, it has been noted that very few have been designed to specifically target blue-collar workers (Ritchie, Herscovitch, & Norfor, 1994). For the most part, programs reviewed were developed for entire organizations, and therefore were found to have a middle class bias ignoring the socioeconomically challenging issues that exist among certain groups (Conrad, 1988).

To date, a host of research is available that suggests the importance of adequately assessing a population targeted for education in order to develop educational tools that foster a path of behavior change. The development of intervention tools should be based on data from community research efforts describing current socioeconomic characteristics, knowledge, beliefs, perceptions, and other psychosocial factors of a specific population (Krebs-Smith et al., 1995).

CHAPTER III: METHODOLOGY

Methods of Consumer Research

The use of focus groups is a consumer research method that can be helpful in ascertaining awareness, beliefs, perceptions and information needs of a group regarding a specific issue in order to develop intervention strategies appropriate for a specific population (Betts, Baranowski, & Hoerr, 1996). Focus group research was developed on the premise that individuals are more willing to share problems and concerns within groups of people with similar problems (Achterberg, 1988). It is a technique suitable for gaining information from exploratory, formative, or process evaluation types of research (Betts et al., 1996).

Using focus groups, researchers observe the manner in which participants respond to a series of open-ended questions posed in a group discussion format. Focus groups are conducted in a permissive, non-threatening environment (Ruud, Betts, & Dirkx, 1993) and can produce insight into a target group's preferences for programs, materials, and products (Krueger, 1988). Focus groups are homogeneous, usually consisting of 6-10 people of similar age, gender, socioeconomic status, and/or background. Thus, the environment tends to be more relaxed than survey or interview environments, as respondents participate and interact with those who are similar to themselves. However, it is essential that participants do not know each other as familiarity may inhibit disclosure during the discussions. Additionally, participants who know each other are likely to discuss past issues or experiences rather than the current issue at hand (Krueger, 1994).

Focus groups are conducted by the researcher using predetermined, open-ended questions arranged in a logical sequence. Groups are most effective when conducted in a series, as response patterns can be detected across groups as well as within groups. Respondents need to be permitted to consider the issues of discussion and respond openly (Krueger, 1994).

Results of focus group discussions have been applied to the development of nutrition education materials (Shepherd et al., 1989, Ruud et al., 1993) as well as intervention programs (Iszler et al., 1995). Populations of limited income and education such as blue-collar workers have been identified as a group in need of education intervention to increase consumption of fruits and vegetables and reduce risk of cancer. However, the perceptions and beliefs of this group regarding the relationship of fruit and vegetable consumption to

cancer prevention have had limited application. Thus, focus groups are the preferred method to ascertain this information for this study. The results of the focus group discussions will be applied to the development of nutrition education materials and programs in an effort to increase fruit and vegetable consumption within this population.

One limitation to the application of results obtained from previous focus groups is that they only reflect the beliefs and perceptions of the audience they employ. Previous research efforts using focus groups to gain insight into consumer preferences for content of nutrition education materials have used primarily college educated women who did not work, and who already felt they had “very good” nutrition knowledge (Shepherd et al., 1989). Researchers have also successfully used focus groups to ascertain perceived benefits and barriers to fruit and vegetable consumption in several different consumer groups who were consuming less than national recommendations of five servings daily (Balch et al., 1997). Participants were ages 25-55 years and had incomes of \$20,000-\$70,000 per year. While overall perceptions and beliefs of the groups were assessed, outcomes reflected a more general audience, and were not analyzed according to socioeconomic status. In a research effort by Iszler et al. (1995), separate focus groups based on age, gender, and child-bearing status were successfully conducted to account for differences in perceptions, beliefs, and eating patterns between groups (Iszler et al., 1995).

While the results from focus group research have been useful in the development of intervention programs, they are only applicable to audiences with similarities to the focus group participants. Thus each time an intervention need is identified for a specific population, focus group research should be implemented using a sampling of the population in need. Relying on previous results from focus group research may produce intervention materials and programs that are not perceived as useful by the population.

Qualitative results from focus groups have also been used to better understand what adults find most useful and appealing in nutrition educational materials (Shepherd, Sims, Cronin, Shaw, & Davis, 1989). Results indicated that different types of consumers had strong preferences as to the content and design of the educational materials. Therefore, it is necessary to adequately assess specific consumer needs and desires of a target population when designing educational information.

Blue-collar workers tend to have diets high in fat and low in fiber rich foods such as fruits and vegetables, which puts them at increased risk for incidence and mortality from various cancers. This indicates a need for nutrition education intervention within this group. However, there is no current research concerning what type of information this group needs. While focus groups have been employed to gain insights into the beliefs and motivations of blue-collar workers regarding coronary risk behaviors in order to develop intervention programs (Ritchie et al., 1994), there is a lack of research reporting perceptions and beliefs of blue-collar workers about fruit and vegetable consumption and cancer prevention.

Overview of the Research Design

This research employed focus group discussions to investigate the most effective way to provide blue-collar workers with information regarding dietary practices and reducing the risk for disease. Six focus groups were conducted with 66 total participants from various worksites. Three consisted of all women and three consisted of all men. The first two meetings were conducted as pilot tests during the week of June 3, 1998, and the other four were conducted during subsequent weeks of the same month. This study received approval from the Institutional Review Board for Research Involving Human Subjects at Virginia Tech.

Separate focus groups were conducted with men and women as they have very different roles in the family unit concerning food selection and preparation. In addition, considering the high prevalence of breast and prostate cancers (ACS, 2000), it was believed that use of mixed gender focus groups would inhibit conversation concerning personal issues.

Sample Description and Sample Selection Process

For the purposes of this study, blue-collar workers were defined as trades persons, plant and machine operators and drivers, laborers, and related workers. Virginia Cooperative Extension agents from Accomack County, Lancaster County, York County, and Chesapeake volunteered to help with the study, and recruited subjects by contacting Human Resource managers from various industrial worksites located in Virginia. Worksites included Perdue processing plant and the Transportation Department in Accomack County, the Food Bank in the Peninsula area, Potomac Supply wood plant and Levi's plant in Lancaster County, and a Buildings and Grounds crew in the city of Chesapeake. The agents also secured locations to

conduct focus groups and provided refreshments for each meeting. All subjects signed an informed consent form (Appendix B) prior to participating in focus group discussions.

Focus Group Procedures

Pilot tests were conducted prior to the beginning of the study to (a) familiarize researchers with methodology, (b) identify potential problems in the line of questioning, (c) fine-tune questions, and (d) ensure that questions elicited group interaction among subjects. Some results from pilot tests were used in data analysis. Major changes in questioning routes are explained in the results.

Pilot tests and focus groups were conducted according to procedures described by Krueger (1994). The moderator was primarily involved with directing the discussions and keeping the conversation flowing. The assistant moderator took comprehensive notes, obtained informed consent from each participant prior to the discussions, operated the tape recorder, and handled logistics. In order to provide internal validity during data analysis, the Extension Agent responsible for subject recruitment was asked to take notes during each session for comparison with notes taken by the assistant moderator. In addition, a short meeting with the Extension Agent and moderator was held after each focus group to compare notes, discuss themes, and discuss suggestions for improvement.

As participants arrived, nametags were distributed and refreshments were served. Introductions were made to familiarize the participants with the moderators and the rest of the group. The moderator began the discussions with a brief welcome statement and overview of the topic and ground rules as described by Krueger (1994). Participants were then informed that conversations would be recorded, and they were asked to sign a consent form. After consent forms were signed (Appendix A), tape recording began with the welcome statement and ended after main themes were summarized with the participants. Before and after the sessions, audiocassettes were spot checked to ensure proper recording. A sample interview guide used for focus group discussions is provided in Appendix B. Towards the end of questioning, participants were asked to rank their top three most preferred ways to receive nutrition education from a list of choices (Appendix C). A seating chart was drawn by assistant moderator before the start of the discussion to help with data analysis. Focus group discussions lasted 60 minutes or less. As participants left, they were presented with thank you gifts.

Data Analysis Procedures

A written transcription was developed from the tape recordings of each focus group discussion. For purposes of internal validity, graduate students were recruited to review transcriptions for completeness and accuracy. For transcription analysis, each page was numbered sequentially, and transcripts were read several times to become familiar with the data (Kreuger, 1994). Since each focus group question correlated to a research question, a preliminary outline was generated to organize emerging themes. While reading the data from each focus group question, a preliminary list of predominant themes was developed. While re-reading the transcripts, quotations were “cut and pasted” into the outline of predominant themes, followed by the page number location of the quote for purposes of identifying the source of the quote. Once a substantial outline of prominent themes was developed, the data was re-read and examined for prominent sub-themes. Themes and subthemes were modified to encompass well-substantiated topics pertaining to ideas relevant to the goals of the research. As described by Krueger (1994), the descriptive summary method was used to report themes in which a descriptive summary of each theme was followed by illustrative quotations and adjective phrases for emphasis and clarity.

CHAPTER IV: RESULTS

Results begin with a brief summary of the demographic characteristics of the subjects illustrated in Table 1. Perceptions relevant to each research question (RQ) were investigated by using one or more focus group questions (FGQ). Research questions with correlating focus group questions are presented in Table 2. Conversation emerging from each focus group question as related to the research questions is presented in terms of major themes and subthemes, and is outlined in Table 3. Quotes are presented to illustrate predominant themes.

Demographics of Subjects

A total number of 66 participants were recruited for six focus groups. Demographic information describing gender and race of participants is presented in Table 1. All participants were working adults recruited from contacts with human resource managers at the various worksites. The approximate age range was 35-65 years. More men (59%) than women (41%) participated. Approximately half of the participants were Caucasian and half were African American or Hispanic.

Focus Group Analysis

Research Question 1:

Perceptions Regarding A Link Between Dietary Habits and Disease Prevention

A primary purpose of this research was to investigate the perceptions of working adults regarding the link between dietary habits and risk for disease. Three focus group questions were posed to develop discussion on this matter. They were (a) when you hear the term “healthy person,” what types of things come to your mind about what a healthy person does; (b) how do you feel your eating habits influence your overall state of health or disease; and (c) what are your concerns for developing diseases such as cancer?

What A “Healthy Person” Does/Eats

Initially, the first focus group question posed to assess participants’ awareness of the link between dietary practices and health was phrased, “When you hear the term ‘healthy person,’ what kinds of things come to your mind about what a healthy person *does*?” It was intentionally phrased in a general manner to determine how frequently eating habits would enter the discussion as compared to other factors. After two focus groups, it was felt that too much beginning discussion was generated away from the topic of eating habits. Because the first question was crucial to setting the tone for the remainder of the discussion, the

Table 1
Focus Group Demographics

County/City	Company	Gender	Caucasian	African American/ Hispanic	FG Totals
Accomack	Perdue Chicken	Female	0	8	8
Accomack	Transportation Department	Male	11	3	14
York	Food Bank	Female	4	4	8
Lancaster	Potomac Supply	Male	4	5	9
Lancaster	Levi's	Female	4	7	11
City of Chesapeake	Buildings and Grounds	Male	11	5	16
	TOTALS		34 (51%)	32 (49%)	66
	Caucasian Women		8 (12%)		
	Caucasian Men		26 (39%)		
	African American/ Hispanic Women			19 (29%)	
	African American/ Hispanic Men			13 (20%)	
	Total Women				27 (41%)
	Total Men				39 (59%)

Note. Percentages in parentheses are percentages of total participants.

Table 2
Focus Group Questions as Related to Research Questions

RQ1: To what extent are blue-collar workers aware of the link between dietary habits and cancer?
FGQ: When you hear the term “healthy person,” what types of things come to your mind about what a healthy person does/eats?
FGQ: How do you feel your eating habits influence your overall state of health or disease?
FGQ: What are your concerns for developing diseases such as cancer?
RQ2: To what extent are blue-collar workers aware of current recommendations for consuming a low-fat, high-fiber diet?
FGQ: How many fruits and vegetables do you feel you need to eat a day to feel healthier?
RQ3: What do blue-collar workers perceive as barriers and benefits to consuming a low fat, high fiber diet?
FGQ: What are some advantages to eating fruits and vegetables?
FGQ: What are some things you could do to eat more fruits and vegetables?
RQ4: What are the daily food and health routines of blue-collar workers?
FGQ: How many servings of fruits and vegetables have you eaten in the past day or so?
FGQ: How were they served or prepared, and where were they bought?
RQ5: What type of educational strategies do blue-collar workers perceive as useful regarding how they can change dietary behavior to decrease cancer risk?
FGQ: Where and from whom do you get your nutritional information regarding fruits and vegetables in the diet?
FGQ: What type of educational information or programs would help you increase your consumption of fruits and vegetables?
FGQ: What types of topics would you like to see covered in nutrition newsletter about fruit and vegetable consumption and disease?

Note. RQ = Research Question, FGQ = Focus Group Question.

Table 3
Summary of Predominant Themes and Subthemes Emerging from Focus Group
Questioning

Research Question 1: Perceptions Regarding a Link Between Dietary Practices and Disease

- I. FGQ: What Types of Things a ‘Healthy Person’ Does/Eats
 - A. Eating Habits
 - 1. Eating habits in general
 - 2. Specific eating habits
 - a. Fruits and vegetables
 - b. Low fat
 - B. Body Weight/Quantity of Food
 - C. Exercise/Activity Level
- II. FGQ: How Eating Habits Affect Health/Risk for Disease
 - A. Dietary habits affect health in general
 - B. Dietary fat affects health
 - C. Fruits and vegetables affect risk for cancer
 - D. Quantity of food affects health/energy levels
 - E. Processed vs. natural foods affect health
 - F. Chemical treatment of food affects health
 - G. Scientific information is unreliable
- III. FGQ: Concern for Risk of Diseases Such as Cancer
 - A. Concern for cancer in general
 - B. Concern for dietary habits
 - C. Cancer is hereditary
 - D. Don’t know causes of cancer

Research Question 2: Omitted

Research Question 3: Benefits and Barriers to a Low Fat, High Fiber Diet

- IV. Perceived Benefits and Barriers to Increasing Fruit and Vegetable Consumption
 - A. FGQ: Benefits
 - 1. Feel better/healthier
 - 2. Increase nutrients
 - B. FGQ: Barriers
 - 1. Taste/desire
 - 2. Time constraints
 - 3. Habits/routines
 - 4. Budget

Research Question 4: Health Routines of Blue Collar Workers

- V. Health Routines of Blue Collar Workers
 - A. FGQ: Daily fruit and vegetable consumption
 - B. FGQ: Preparation techniques
 - C. FGQ: Purchasing

Table 3 continued

Research Question 5: Useful Educational Strategies

- VI. FGQ: Sources of previous nutrition education
 - A. Non-interactive sources
 - B. Interactive sources
- VI. FGQ: Preferred educational interventions
 - A. Television segments
 - B. Newsletters
 - C. Worksite programs
 - D. Newspaper/magazine articles
- VII. FGQ: Preferred newsletter topics
 - A. Nutrition topics related to disease
 - B. Health benefits of fruits and vegetables
 - C. Recipes and menus

question was re-worded more specifically for subsequent focus groups as, "...what comes to mind about what a 'healthy person' eats?" The majority of responses to this question related to three predominant themes concerning (a) eating habits, (b) body weight/quantity of food consumed, and (c) exercise/activity level. Themes and subthemes that emerged from the first focus group question are illustrated in Table 3.

Eating Habits Influence Health.

Most participants appeared to feel that a link between dietary habits and health exists, though responses about eating habits varied in terms of specificity. When categorized into subthemes, comments were either very general or very specific. Very general statements included, "eat well," or were phrased in a way that indicated there were "right and wrong foods" to eat in terms of health. These general comments were made frequently:

"Don't eat anything that tastes good."

"[Eat] the right foods."

Other general comments included the idea of balance such as "three balanced meals" and "portions of your different food groups." Of those who answered in terms of balance, only one person elaborated in detail on what balanced eating meant to him:

"Balanced diet. Proper ratio of proteins, fats, and carbohydrates. Not too high in fats or excessive proteins either. More of the complex carbohydrates."

This type of detailed response was the exception rather than the rule, and further conversation from this respondent indicated that he had educated himself on nutritional issues for his own benefit.

When a "healthy person's" eating habits were described more specifically, the two most prominent subthemes that emerged were "fruits and vegetables" or "low fat" habits. The most prevalent *specific* eating habit mentioned about what a "healthy person" might do dealt with eating more fruits and vegetables, and freshness was perceived as a major factor contributing to the health benefit of fruit and vegetable consumption, though for varying reasons:

"...I found out why cancer grows in this country is because we're not getting enough enzymes out of the vegetables. Everything's been pasteurized or killed..."

“...in our day my mother grew our garden and you had fresh vegetables...But today everybody eats out of a box, and there’s just so much stuff in those boxes, you know salt and preservatives and everything else added to them you don’t know what in the world you’re getting today.”

“...fresh vegetables, not canned which is very bad for a person if you have any type of problem with sodium. It’s just good to eat the natural things...”

“Low fat” eating was the second most prominent subtheme mentioned in terms of specific eating habits, and was usually a direct quote without reference to any foods in particular. A fiber-rich food was mentioned by only one person, but in the context of low fat content rather than high fiber content:

“I have a son who I consider very healthy, and he is extremely picky about what he eats. He doesn’t eat anything with fat. He doesn’t eat any sugar, I mean, with few exceptions. He eats brown rice...First thing he looks for anything that’s low fat or anything that’s healthy on the menu.”

Less prominently suggested food items were dairy, meats, water, and vitamin supplements. Dairy foods, water, and supplements were each mentioned only once. Meats were mentioned as a healthful food by one person, but were on the list of foods to avoid according to another. Reading labels was also a health-related behavior mentioned by only one person.

Body Weight/Quantity of Food Consumed Influences Health.

The second most prominent theme emerging from the discussions about “healthy people” focused on maintaining a specified body weight. Body weight comments could be divided into viewing “slim” or “slender” as being healthy, or “overweight” or “obese” as being unhealthy. About half of the participants who mentioned weight in terms of health felt that the quantity of food consumed was the most influential factor in affecting body weight:

“Talking about weight, even if you eat the right foods, you can eat too much of them and get overweight.”

“I don’t have three balanced meals a day. The first thing that I’d be is obese, and that ain’t healthy.”

During one discussion on body weight, one person elaborated on having to adjust his food intake as he aged:

“As you get older you tend to realize you can’t eat a bag of chips with 3 sandwiches. As you get older you have to adjust.”

Only one participant voiced some confusion as to whether or not weight affected health based on the apparently unhealthy appearance of her small-framed mother:

“And so my mother’s just a short little person. Even today’s she’s 84 and I don’t even really see her as healthy because of her skin and everything. She does what she used to do, she’s mentally alert, and she still does her garden and cans everything. And she’s still only 4’7” and about 104 pounds, but I don’t look at her as healthy. She just doesn’t look healthy.”

Exercise/Activity Level Influences Health.

Though eating habits dominated the majority of the conversation, exercising or “staying active” also was a major recurring theme in terms of what participants thought a “healthy person” would do. Most participants who mentioned exercise did not elaborate. Those who did elaborate spoke of jogging, walking, or running anywhere from three times a week to everyday. Two persons spoke of adjusting their food intake to account for their activity level:

“While you’re working you can basically eat most anything cause you will burn it off. Usually when you go home you have to careful about what you eat...like a salad and juice...not a lot of fried foods...”

“If you sit in front of the t.v., you’re gonna have to change your eating style. My stomach got that way from eating in front of the television.”

Influence of Dietary Habits on Disease Risk

The second focus group question asked participants how they felt their dietary habits in particular influenced their overall state of health or disease. Major themes that emerged included that (a) eating habits affect health in general as well as specific disease states, (b) chemical treatment of food affects health, and (c) scientific information is unreliable. Table 3 summarizes the major themes. When specific eating habits were discussed, several themes that had developed during the previous focus group question re-emerged, such as the

influence of dietary fat, fruits and vegetables, quantity of food intake, and whether or not foods were processed.

Dietary Habits Affect Health in General.

As with responses to the first focus group question, responses to the second question involving the influence of food on health ranged from very general to very specific. General comments for example included phrases such as “poor eating habits” making “you not feel good,” “tired,” or “sluggish.” Almost everyone felt eating habits played a significant role in health:

“If you have poor eating habits, you don’t feel good.”

“Definitely you are what you eat. If you’re gonna stay around.”

Some participants felt strongly about a connection between dietary habits and health. However, while one person felt eating habits were influential over health, she did feel there was a certain amount of “junk” food a body could tolerate before health became affected. This illustrated how there were varying opinions as to how much nutrition affected risk of disease:

“I think [eating habits affect health] 50%, because your body can be allowed so much junk food or whatever. But I don’t think your body can overtake it either.”

Eating Habits Affect Specific Aspects of Health.

Many comments were directed toward a specific disease such as diabetes or heart disease, and were offered from personal experience. Participants who had experienced a disease elaborated on their own attempts to change their eating habits in response to the disease. Furthermore, those with testimonials appeared to have a stronger belief that eating habits influence health than participants who had not directly experienced disease:

“What you eat is very important in your habits. Years ago I did everything to excess and I paid the price medically with heart disease. I’ve listened to the doctors and nutritionists for the past 10 years, and so far knock on wood it’s working. But nothing worked until I changed my eating habits and quit smoking. To me it must be important because it worked.”

“[Food] can tear [your health] up. Cause I have sugar and it’s down now. Well, talking about carrots, he told me about them,

like my eyes—I've been having trouble with them. So I went and got a juicer and started drinking a lot of carrot juice. Well, the next thing I know it ran my sugar up. Way up.”

Dietary Fat Affects Health.

Dietary fat was a major recurring theme in the discussion of eating habits and health. Most discussion of dietary fat referenced high fat preparation of foods, specifically frying. Perceptions that arose on the subject were that fried foods decreased energy levels, increased blood cholesterol levels, increased blood pressure, and slowed digestion. People discussing high fat foods frequently mentioned meat, though others avoiding meat did not necessarily mention high fat content as a reason. Many participants were trying to cutback on their intake of meats for health reasons:

“You have less chance of disease by eating proper...We know pork has been a factor for years. Greasy fried foods, chicken skin...that has been a factor towards affecting our bodies.”

“...[my cholesterol] dropped 50 some points when I quit eating a whole lot of fat meat like bacon, sausage...I used to eat that five, six, seven days a week. Now only maybe once on the weekends.”

“The main thing we eat is turkey, chicken, fish. No red meat, no pork chops or whatever, and that brought my pressure down. I don't have to worry about pressure pills, and it's been that way for five years.”

“No pork, trying to cut down on fried food. Pork chops give me a headache.”

Only one participant was aware of dietary recommendations for different types of fats from information supplied by foundations for disease prevention:

“It's something that everyone talks about, but I think people are getting more aware with news media and the way advertising does with foods, bringing up things like what different kinds of fats there are. You know fat is fat, but now they're talking about 2 or 3 different kinds of fat and the kinds of food you're supposed to eat, and it gets you more aware of it through advertising and stuff like the cancer foundations and the heart foundations with their things that they tell you about heart problems and circulation problems that can

develop from wrong eating habits. I think that's the kind of thing that is making people aware of it."

Fruits and Vegetables Affect Health.

While consuming fruits and vegetables was a recurring theme, it was not nearly as prominent as avoiding dietary fat. Only two participants who mentioned cutting down on meat also mentioned increasing fruit and vegetable intake. They seemed to have a clearer picture of the role of fruits and vegetables in disease prevention, and were the only ones to mention the role dietary practices play in preventing cancer specifically. This type of response was infrequent, and the only specific type of cancer mentioned in relation to eating habits was colon cancer:

"If we're eating right, and getting all your vitamins and nutrients, that's gonna help prevent you from some diseases or help you get along the way with disease...Now carrots, your beta carotene, broccoli, and fruits, limit meat...these help to prevent cancer."

"Your dietary problems deal with your digestive tract cancer...colon, rectal, any type intestine...It has been documented that a diet that's high in fat and processed foods does have nitrates...the longer it stays in your intestinal tract the more chance it has to leave off some residue that causes trouble...So therefore you eat more fruits and vegetables and your system cycles itself through quicker...I think that's been studied in Africa where they eat mostly vegetation they have almost no digestive system cancer...They eat a lot of fiber."

Others mentioning fruit and vegetable choices described their impact on health in more general terms. For instance, "salads" and "greens" make you "feel good" and "a lot more awake."

Quantity of Food Consumed Affects Health/Energy Levels.

The idea that the quantity of food consumed influenced health was reminiscent of some responses to the first focus group question involving the relationship of weight control and health. This was partially the result of continuing conversation that had already developed on the subject. "Portion sizes" came up several times in conversation. One participant with diabetes had been placed on a strict diet when he was originally diagnosed.

However, he discovered that he felt best when he was able to continue eating his traditional foods, despite being advised against them, by simply cutting back on the portion size:

“So you can eat fried stuff, but you don’t eat as much as you used to. You maybe used to eat three or four pieces, now you only eat one piece.”

The overall tone of the respondents who commented on portion sizes indicated that they felt it was difficult to control serving sizes in order to maintain or reach a healthy weight. One person felt that portion sizes, as she had learned them from previous nutrition instruction, were not realistic:

“...a lot of times when they tell you to go on these diets they tell you, ‘well don’t eat more than a half a cup of whatever.’ Well, I sure do like a good cup serving.”

Another participant indicated that he felt weight gain affected lifespan, but not by much in the overall picture. Furthermore he was not willing to change his eating habits despite feeling this way:

“I like to eat, and it makes me gain weight...do I want to live to be 85 or do I want to live to be 80? Well I want to keep on eating and live to be 80.”

Processed vs. Natural Foods Affect Health.

Several responses on the subject of eating and health suggested that people felt processed foods may contribute to risk of disease. Comments revealed concerns over foods losing valuable nutrients during processing, preservatives added during processing causing disease, and not being able to control the substances in the food they buy. Despite these concerns, few participants indicated they were avoiding processed foods, and lack of time to prepare food was the most frequent reason given for purchasing them:

“If you’re eating fruits and vegetables out of a can, which most of us do, you’re not getting much out of it.”

“I do think as far as eating habits go, if you can eat food that is closer to being pure food, you’re a lot better off than eating processed stuff.”

“The assumption is a lot of the preservatives in the food are causing a lot of problems...and you just don’t take the time to fix and prepare...fresh food. Everything comes out of a can or

microwave dish. I know a lot of this fast food, who knows what you're eating a lot of the time? Is it prepared right?"

"We're at the mercy of the farmers, the producers, food industry...whatever they decide to put in it. How many times do you go to the store and read exactly what's in your canned fruit that you buy, or your vegetables...you can't pronounce the words anyway. So we're at the mercy of the government and the industry. *[Moderator: So there's only so much that you feel is in your own control?]* Well, so much that you grow your own vegetables, and now a days you just don't have time to do that."

Minor themes that emerged in response to how eating habits affect health included comments regarding water consumption, sugary foods, salty foods, and eating late at night.

Chemical Treatment of Food Affects Health.

The topic of pesticides and chemical treatment of food came up in two focus groups, but remained a less predominant theme in all conversations. One participant at the Transportation Department had a close friend who had sought some alternative healing practices involving nutrition and organic foods to battle cancer. In reaction to this, the participant decided to modify his own lifestyle by eating organic foods and juicing as preventative practices. Also, he had convinced some other co-workers in the group to try these things. In this focus group, the impact of a close friend's experience with disease had a strong influence over behavior that had spread somewhat through the group. They were particularly cautious of chemical treatment of food, and appeared to feel a lack of control over the issue:

"Yeah, but what about the diseases that are coming in to our bodies through the food we eat? They're doping up the meat and the vegetables, they tell you it's good for you, and you come back and say, 'oh, they put chemicals in it.' That's got to be making you sick too."

Scientific Information is Unreliable.

Two focus groups introduced the idea that nutrition information is difficult to trust because it is consistently changing. The two groups independently brought up a recent issue that eggs may not be as bad for health as previously predicted:

"They something's bad for you, and in ten years they say it has nothing to do with it."

“I mean there was a big egg scare a few years back, and now all of a sudden eggs are great for you.”

“...today, ‘eggs are gonna kill you’ ...in six months, eighteen months from now, ‘hey you gotta eat eggs cause they’re the greatest thing since iced tea.’”

They attributed the consistently changing information to subjectivity of scientific interpretation and excessive available information:

“I think the scientists interpret what they want to.”

“I think there’s just more information out there. Whether you can believe it or not, I think that’s what the problem is.”

Concerns for Risk of Cancer

In the third focus group question, participants were asked about their concerns for specifically developing cancer. While everyone was concerned about cancer, responses were categorized according to having either a high or low sense of urgency to reduce risk by changing health-related behaviors. Predominant themes included concerns for (a) dietary habits, (b) production of foods, (c) heredity, and (d) not knowing the causes of cancer. Table 3 summarizes major themes.

Concern for Cancer in General.

Almost everyone was concerned about cancer, but comments indicated two divergent attitudes concerning the desire to change health related behaviors to reduce disease risk. Participants either had a low or high sense of urgency to change health related behaviors. Those who were less willing to change did not mention any type of personal experience with disease:

“I think a regular checkup at the doctor if you feel something that’s not right. Most of the time I know myself, I’ll just put it off....You hear about [cancer] all the time, but you don’t actually enforce it for ourselves.”

“...We’re all aware of disease, but I don’t sit there wasting my valuable time worrying about if I’m going to get it...”

One participant summarized the reactions of several others in that he felt that the causes of cancer were beyond his control. He also believed that changing eating habits would not have a significant impact in reducing risk for cancer:

“Most of us think of cancer as the killing disease in a group around here, and I think it’s the whole environment. I don’t think that anyone changing their eating habits drastically is really going to help that much.”

While these participants had a low motivation to change their lifestyle or practice preventative health habits, other concerned participants felt a deep sense of urgency to change and had already begun doing so. All of the people who had initiated some sort of health related behavior change had either experienced disease themselves or through a loved one:

“I know I was sick all the time till I started this [program]...a friend of mine got cancer, and that’s what got me on it. They gave him two months. That was last March, and he’s still walking around. Now I don’t know if that’s got anything to do with it or not...”

“...now I can say for myself the food was actually killing me....and so I can say for myself, if you eat the wrong kinds of food...some foods you eat actually take your energy from you.”

In response to some of the testimonials given during one group, one man summarized the impact of experiencing a disease on desire to change health related behaviors:

“...and the fact is until it starts hurting us,...a close friend having cancer or somebody that you ride to work with having a heart attack...that it either hurts you physically or mentally, I think you’re pretty well gonna stay the way you are.”

Concern for Diet Affecting Risk for Diseases.

Eating habits were probably the most recurrent theme when discussing concerns for diseases such as cancer, though comments about eating habits remained fairly general in nature. Participants mentioned practicing “better eating habits,” being on an eating “program,” having “a diet to go by,” or changing their cooking methods to “the 3 B’s...bake, broil, and boil.”

For the most part, participants expressed a high level of concern for cancer, though many felt their risk for cancer was out of their control. For instance, a major subtheme concerning dietary habits revolved around food production methods, processing methods, and use of chemicals or pesticides, which was reminiscent of earlier conversation:

“I still think some of this stuff is coming from the chemicals they put on the crops. And you can’t touch it, you have to wear a mask, yet it won’t hurt you. I don’t buy it.”

“I think over the years, we have a lot of cancers that are known to be contributed by foods that we’ve eaten, and the way the farmers have grown it, the soil that it was produced in, where people have dumped things prior to the people farming the land...”

“We’re all concerned about getting [diseases], but like Bill said, we’re at the mercy of the farmers and the producers.”

“...If food was born the natural way it’s supposed to be made, then the body would react accordingly. With the things the preservatives does, the body wasn’t made to react with a foreign substance.”

The topics of quantity of food consumed and weight control also reoccurred in terms of concern for disease, but were mentioned mostly only in terms of energy levels, cholesterol levels, diabetes, and heart disease:

“...Therefore I definitely believe that the diabetes and congestive heart failure came from the overweight.”

While this remained a predominant theme due to the fact it was reminiscent of earlier conversation, it remained a minor theme for the topic of cancer specifically. Only one participant attributed excess food consumption to a potential cause for cancer. This participant’s father was recently diagnosed with cancer, and he could not understand why he might have gotten it. After reflecting upon it in conversation, he decided it might have been excess weight and energy consumption:

“...my father was just diagnosed with cancer. I always thought we ate well. We always had the vegetables on the table, the basic food groups at every meal. My father is overweight...he’s a big man, but he ate right. He didn’t have a lot of fried stuff, he didn’t eat a lot of fatty stuff, but maybe he just ate too much.”

Disease is Hereditary.

A large number of participants felt heredity played a large role in determining personal risk for certain diseases, especially for cancer. Generally participants who felt strongly about the role of heredity in disease felt changing dietary habits would not make much of an impact of reducing risk for disease. Some participants felt strongly about the effect of heredity on risk for disease if they had know family or friends with apparently healthy lifestyles to be affected by disease:

“As far as a healthy person goes, we used to have a timekeeper, played golf everyday. He was small. He had a heart attack. So who defines who has a heart attack? Got a small fellow with a cholesterol problem, so it’s all hereditary.”

“The reason that I think it’s all part of how your body handles it is my father is a health freak. He don’t do nothing but drink bottled waters, eat fruits, eat things that are supposedly good for you, and he has all kinds of problems with his blood pressure, heart and all kinds of stuff.”

“...cause if you’ve got diabetes in your family, you’re predisposed to it. I don’t care what you eat. It just may come sooner if you don’t eat the proper diet...so no matter what we eat it’s not gonna help it a whole lot cause we’re gonna get it anyhow if we’re old enough.”

Causes of Disease are Unknown.

Lack of knowledge about cancer was a final predominant theme. Many participants did not know the causes of cancer, and some did not see a relationship between diet and cancer:

“I can’t see what eating’s got anything to do with breast cancer. I don’t see that. I don’t know about that.”

“I guess cancer’s one that I didn’t much consider as one that comes from nutrition. I never thought of it that way. More of the stuff I focus on is the exercise to keep you healthy with your heart and your blood circulation, and obesity with being fat. These kinds of things would cause problems, but I never thought about cancer.”

Others felt skeptical about who really knew the causes of cancer:

“Well I’ve had cancer...and so I don’t know how or why, but it just befalls you. So, I don’t think it’s what you eat so much as uh...who knows? Cancer to me is just sort of the general law. If they can’t find out exactly what you have, that’s what they lump it into.”

“As far as the cancer goes, who knows what causes cancer? I mean you hear all kinds of things about...one time cranberries cause cancer. So you know you quit eating everything that causes something...but nobody knows what causes what.”

In general, it was not uncommon for comments concerning cancer to focus on factors that were not within a person’s control such as food processing, chemical treatment, or heredity. Other minor themes included a concern for mental health and stress reduction, and environmental issues.

Research Question 2: **Perceptions Regarding Dietary Recommendations**

Before beginning this research, it was believed that it was important to determine whether or not existing nutrition educational efforts had penetrated the study population. Therefore, a second rationale for this research was to gain an understanding of how well participants were aware of the recommended five daily servings of fruits and vegetables. Initially, the question was worded, “How many fruits and vegetables do you feel you need to eat a day to feel healthier?” The first focus group did not appear to understand the question well, and did not generate significant conversational data. The second focus group also had a difficult time understanding the question initially, though conversation developed after the moderators presented a scenario phrased as, “Say someone doesn’t eat many fruits and vegetables, and they want to improve their health by eating more. How many fruits and vegetables would they need to eat in a day before they started seeing health benefits?” No one in the second group was aware of current recommendations. Comments on the topic included “fruits and vegetables don’t have anything to do with disease,” “no one knows how many you should eat,” “benefits are dependent on the individual and their genetics,” and “eat everything in moderation.”

Due to the lack of awareness of the recommendations regarding fruit and vegetable intake during the first two groups, as well as the confusion the question tended to generate, it was ultimately decided to drop the focus group question. Without it focus group flow

improved, and specifics regarding fruit and vegetable intake were addressed in subsequent questions. Since this focus group question was the only one used to address research question 2, the research question was subsequently disregarded.

Research Question 3:
Perceived Benefits and Barriers to a Low Fat, High Fiber Diet

In order to design educational materials that specifically address barriers to fruit and vegetable consumption, a third major objective of the research was to determine perceived benefits and barriers to increasing consumption. Participants were first asked directly about the benefits of fruits and vegetables. They were subsequently asked what types of things they could do to increase their consumption. Major themes are illustrated in Table 3.

Benefits of Fruit and Vegetable Consumption

When subjects were asked what they perceived as advantageous to consuming more fruits and vegetables in their diet, only two predominant themes emerged. The first predominant theme was an overall better feeling of physical health in general, and most comments reflected immediate health benefits as opposed to long-term health benefits. For instance, participants felt that eating more fruits and vegetables “makes you feel better,” “makes you alert,” “keeps you regular,” “keeps you clean,” and “keeps you from feeling bloated.” Very few comments revealed concern over long-term health benefits such as disease prevention.

The second predominant theme that emerged involved increasing beneficial nutrients. Specific nutrients mentioned included vitamins, minerals, and fiber. Only two people mentioned specific physiological benefits of additional nutrients, which included fiber’s impact on digestive tract health and regularity. Specific comments were as follows:

“...eating fruits and vegetables, it really helps your bowels, and along with that it just helps your whole body...you know with the vitamins and stuff like that.”

“It just makes you feel better if you get that in your diet as opposed to the low fiber stuff...high fiber as opposed to low fiber.”

“The healthy end of it. You get vitamins and minerals from it...”

One participant also mentioned decreasing detrimental nutrients such as excess fat by decreasing meat intake

“...healthier for you than meat...because that meat you get a whole lot of fat and different stuff that your heart don’t really need.”

Barriers to Increasing Fruit and Vegetable Consumption

When asked about the barriers, or “what kept them from eating more fruits and vegetables,” predominant themes were (a) a lack of pleasurable taste, (b) lack of time to prepare them and the availability of convenience foods, (c) having more exposure to them by having more on hand or making routine changes, and (d) budget.

Eating For Pleasure versus Health Benefits.

Taste was the most prominent theme regarding what kept people from eating more fruits and vegetables. Though most people liked the taste of produce, comments revealed that the temptation of “comfort foods” was an influential factor governing food choices:

“But I think if most of us were honest, if we had a strawberry shortcake sitting there, and an apple or banana, most of us are gonna go for the strawberry shortcake.”

“...like I was saying with the broccoli, if they advertise on the TV they can make broccoli taste like ice cream, you’ve got it made.”

“Whatever it is about comfort food is what needs to go into fruits and vegetables to make them more appetizing.”

One person summarized how the desire to eat for pleasure can be stronger than the desire to eat for health:

“The bottom line is people do what they like, and not what’s good for them. You have to train yourself to eat that stuff.”

Another person discussed the struggle between making choices based on taste versus health benefits, and suggested that education can help keep them mindful of health benefits:

“You know you get yourself set on certain tastes you really like...you got to get your mind set off that because of the importance of eating it. Advertising

and education would be good now to try to help us realize these types of things.”

Time Constraints.

The second most predominant theme regarding barriers to fruit and vegetable consumption was a lack of time. Long work hours and “shiftwork” influenced both the amount of time available to cook and the desire to cook:

“I don’t have the time. I work all the time...that’s my biggest problem.”

Furthermore, with hectic work schedules, the availability of convenience foods made eating fruits and vegetables less likely:

“...it’s much easier to grab something that’s fattening than something that’s healthy.”

“You work hard in the heat and humidity, and by the time you get home, you don’t want to prepare any food. I’ll be honest, like I say microwave or out of the can, and that’s not too healthy.”

Routines.

The difficulty of changing routines and breaking old habits also surfaced as a major reason for not consuming more produce. One focus group discussed the impact of the habits learned during childhood. Several focus groups mentioned that simply “having more produce around” would make them more likely to consume more. A few ways participants suggested breaking routines included programming the mind to change a routine, introducing small portions at a time to family members, and learning diverse ways to prepare fruits and vegetables:

“It has to start being a routine. You have to get into the routine of it. If you don’t, you won’t do it.”

“It’s a routine, but it’s very hard. You have to program your mind to do it everyday.”

“Some people won’t try it. Like my children, I have to introduce small portions one at a time...and that way you get them started...”

“To eat more vegetables, all you have to learn is diversity. The different ways to prepare it...The more you learn how to prepare them, the more you’re gonna eat.”

Budget Constraints.

The fourth most predominant theme inhibiting fruit and vegetable consumption was the cost. As summarized by one participant, fresh produce was perceived as expensive compared to convenience foods:

“It costs a lot more to eat healthy than it does to eat junk.”

Less prominent themes affecting consumption of fruits and vegetables included limited shelf life and lack of freshness. These factors also were considered to be an added expense if produce was inedible upon purchase, or was not consumed before spoiling:

“They go bad too fast.”

“Buy stuff like apples that will last long...there’s nothing that irritates me more than throwing food away.”

“...I personally do not like to eat apples from the supermarket in the winter because they’re just not fresh...”

“They don’t look good in the stores anymore...not fresh.”

Research Question 4: Daily Health Routines of Blue Collar Workers

Behavioral interventions require an understanding of the target population’s habits. In order to gain an understanding of the daily health routines of working adults, the following questions were presented during focus groups: (a) how many fruits and vegetables do you eat in a typical day, (b) how are they usually served or prepared, and (c) where do you normally purchase them? Prominent themes are illustrated in Table 3.

Daily Fruit and Vegetable Consumption

When subjects were asked to recall the average number of fruit and vegetable servings they consume in a day, approximately twenty-five percent of participants responded

with five or more servings. Of those eating more than five servings, several participants were making a conscious effort to do so. One person whose friend had cancer was juicing as a cancer preventive measure. Another person who had experienced a heart attack had an Asian wife who prepared only vegetarian meals. While these people had a vested interest in health, another person attributed consuming 5-6 servings of fruits and vegetables daily to eating at a restaurant buffet twice a day.

Of those who consumed less than five servings, the majority appeared to consume approximately three servings daily. A surprising number of participants ate less than 2 servings daily. At least seven participants indicated they did not like them at all, and avoided them purposely.

Preparation Techniques

When asked how people prepared their fruits, the majority ate them raw. Some ate canned fruit frequently. Very few people mentioned cooking fruits, except in desserts such as pies.

“Only ones I ever had were raw.”

“I don’t remember eating cooked fruit.”

“Raw” salads also were a popular form of vegetable consumption. However, the most prominent forms of vegetable consumption were frozen and canned.

“Most of the stuff, particularly in the winter, is processed. I mean, it’s out of the can or it comes frozen. I don’t think there’s too many people anymore that take the time to really go with fresh, non-processed vegetables.”

When asked about seasoning vegetables during cooking, about half of the participants were trying to cut down on heavy seasonings, and the other half were not. Persons attempting healthier seasoning practices reported using bouillon cubes in place of animal fat, reducing the amount of seasoning used, using salt alternatives, and eliminating seasoning altogether. Those who were using heavy seasonings reported using one or more of ham drippings, butter, margarine, mayonnaise, salt, and pepper.

In terms of appliances used, most people heated frozen and canned vegetables on the stove. Microwaves were most often used for reheating only. While a few persons mentioned steaming, a few others would comment about not liking “crispy” vegetables, making steaming a less prominently practiced method. Few people used mentioned using grills.

Purchasing

Almost everyone bought most of their fruits and vegetables at grocery stores. Many mentioned shopping at outdoor markets and fresh produce stands when they were in season, though only occasionally.

“Fruit stands in the summertime, markets in the winter.”

While a few had gardens in the summertime, the majority reported not having time to tend a garden.

Research Question 5: Useful Educational Strategies

In an effort to design educational interventions the population would perceive as useful, three focus group questions were posed to determine educational preferences: (a) where and from whom do you get your nutritional information regarding fruits and vegetables in the diet, (b) what type of educational information or programs might help you increase your consumption of fruits and vegetables, and (c) what types of topics would you like to see covered in a nutrition newsletter about disease prevention?

Sources of Previous Nutrition Education

The first focus group question regarding nutrition education was aimed at determining sources where participants had previously received nutrition information. Table 3 illustrates a summary of predominant themes.

Non-interactive Sources of Information.

Televisions, magazines, newspapers, and radio were all mentioned as non-interactive ways some of the participants had previously received nutrition information. No one elaborated on the type of information they received from these sources. In addition, education received through these sources appeared to be unintentional, as several people described “catching bits of information wherever I can.” Specific programming such as health-related television or radio shows were not mentioned.

Interactive Sources of Information.

Interactive sources of information were mentioned much more frequently than non-interactive. The most predominant interactive sources were the doctor’s office, community programs, and family habits learned while growing up. Unlike those who mentioned non-interactive sources as their primary source of information, those that mentioned interactive

sources elaborated on specific ways they received the information, and what type of information they received:

“You go to the doctor, you see all these charts up in his room. He shows you what’s gonna happen if you eat butter, milk, and all these things...”

“There’s a lady that come around at work and help us with our nutrition, cause my cholesterol was high...she gives us things from the department of health, some brochures that cover anything from exercise to what we’re covering today.”

“I attended a seminar and the high blood pressure organization in Richmond that has seminars and they teach you about nutrition...the low fat, fruits...”

However, several participants who felt that their doctors were their primary source of nutrition information didn’t feel they were an adequate source of knowledge:

“The thing about the doctors—the doctor I go to now he says you gotta lose weight, but he doesn’t know how to do it. And most of the doctors don’t tell you what to do.”

“I met a lady on Sunday that just got into these herbs and stuff, and this doctor told her cancer feeds off sugar. I’ve never heard that before. But some doctor told her that so when a doctor tells you something, you think hey it’s right.”

“You know like the doctor can’t really tell you much. Like the doctor I’m seeing.”

Most group education programs mentioned were offered by the participant’s worksite. Other programs were offered through the health department, church, and health organizations. Health topics mentioned during conversation included cholesterol, high blood pressure, exercise, and weight control. Brochures were the only educational material mentioned during discussion of educational programs.

A few focus groups felt most of their education was during their upbringing at home or through school, though this remained the least predominant of the interactive sources. Some of these comments focused on the lack of knowledge they had during this time:

“We weren’t informed about nutrition, vitamins, minerals. We had what we ate.”

“Home Ec. class. We had working mothers, and when both are working it makes it real tough because they don’t have time to teach you to cook.”

Information is Difficult to Trust.

Finally, the theme that nutrition information is difficult to trust arose with this question, and was reminiscent of earlier discussion regarding dietary habits and disease prevention. One participant felt there was too much information available to know what was true and what was not:

“I think it’s hard to believe any of it.”

“Hard to know what to believe and not to believe...”

“I don’t think anyone pays attention to it.”

Preferred Educational Interventions

Towards the end of each focus group, participants were given a list of educational preferences, and asked to rank their top three preferred ways to receive nutrition information. Scores were assigned to each item by giving three points if a person ranked a method as first choice, two points for second choice, and one point for third choice. Total scores for each educational method were calculated, and results are illustrated in Figure 1. In order of most to least preferred, the four highest scoring educational methods were (a) television segments, (b) newsletters, (c) worksite programs, and (d) newspaper/magazine articles (Figure 1).

Preferred Newsletter Topics

When participants were asked what type of information they would like to see featured in a newsletter about nutrition, nutrition information related to specific disease issues was overwhelmingly the most predominant theme. Other themes included wanting to know about the health benefits of specific fruits and vegetables, and recipe and menu ideas. Themes are summarized in Table 3.

Nutrition Related to Disease Issues.

When asked what type of information they would like to see featured in nutrition newsletter, nutrition related to disease was the most predominant theme. Most participants indicated an interest in issues related to diabetes, cholesterol, or blood pressure, but did not mention specific issues. Only a few people indicated an interest in the specific physiological effects of food components such as “salt,” “potassium,” and “the different types of fats.”

Two other persons mentioned wanting to know about “nutritional side effects of medications.” While inquiries about cardiovascular disease and diabetes were numerous, only three people who had been surprised to hear that nutrition may be connected to cancer indicated an interest in finding out more about the relationship:

“How the nutrition or the foods you eat could encourage or inhibit cancer. That just caught me off guard. I never thought of that.”

Health Benefits of Fruits and Vegetables.

The second most prominent theme for desired newsletter topics was health benefits of fruits and vegetables. People mentioned wanting to know advantages and disadvantages of specific fruits and vegetables, what makes them beneficial, and which ones are beneficial or hazardous to certain health conditions:

“The best thing for better health is to eat lots of fruits and vegetables, but they don’t say why. The ‘whys.’ What are the advantages and disadvantages.”

Recipes and Menus.

The final predominant theme regarding desirable newsletter topics was recipes and menus. People wanted to know “healthier” ways of cooking, how to “not overcook” vegetables, and how to cook vegetables “you might not normally eat.” Another factor mentioned was menu planning:

“I run into a lot of problems with recipes and fixing a menu...a meal...a balanced meal. You can think, ‘I’m supposed to eat a banana.’ But then you have to think, ‘What goes with a banana?’ Maybe fish is good, a half a grapefruit, an orange. But if you put out a newsletter and had three meals already planned, that would be really helpful.”

Less predominant themes regarding newsletter ideas included fitness and exercise topics, how to read a food label, information about food processing, supplements, and current research. One person suggested including a section sharing the experiences of others such as “what worked for them.”

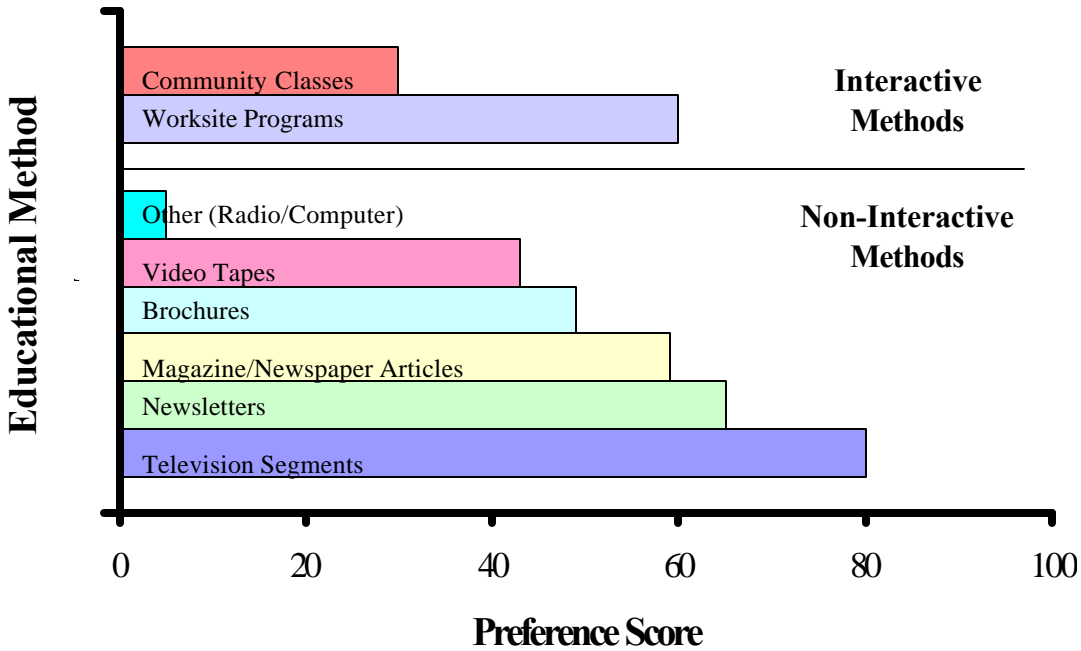


Figure 1. Total preference scores for selected methods of nutrition education. Focus group participants selected their top three preferred methods of nutrition education from a given list by marking either “1,” “2,” or “3.” First choice preferences were given three points, second choice preferences were given two points, and third choice preferences were given one point. Points were then added up for a total preference score for each method.

CHAPTER V: DISCUSSION

Research Question 1: Perceived Link Between Dietary Practices and Health

The first rationale for this research was that rates of diet-related diseases such as cancer remain high, and fruit and vegetable intake remains relatively unchanged for most adults. With this in mind, it was important to determine whether or not participants perceived a link between their own eating habits and risk for disease. As previously stated, the focus group questions posed to develop discussion on this matter were (a) When you hear the term “healthy person,” what types of things come to your mind about what a healthy person does? (b) How do you feel your eating habits influence your overall state of health or disease? and (c) what are your concerns for developing diseases such as cancer?

Questions regarding the link between dietary habits and disease revealed that the majority of comments reflected a perception that eating and exercise habits were the most influential habits affecting a person’s health, and body weight was a significantly demonstrative characteristic of a person’s health.

Most comments about eating habits referenced fairly general concepts such as “balanced meals,” “low fat,” and “eating right.” While eating fruits and vegetables as well as low-fat foods were predominant perceptions of healthful eating, very few people offered details of specific recommendations connected with health or disease. Most participants were more aware of the detriments of eating too much fat and calories than the benefits of consuming fruits and vegetables. Therefore, most nutrition knowledge of dietary habits and disease was demonstrated in comments describing what to avoid, including fatty foods and meats, in order to improve cardiovascular health and reduce body weight. Reducing total fat appeared to be the predominant attitude among focus groups concerned about fat intake, while replacing saturated fats with monounsaturated, polyunsaturated, essential fats, or fruits and vegetables was never suggested. In addition to reducing total fat to control body weight and improve health, regulating portion size also was a recurrent theme. Overall, the impact of dietary habits was discussed more frequently in relationship to cardiac health and diabetes than to cancer.

Concerns for a potential relationship between food processing, pesticide treatment, and disease was not a strong theme within each focus group, but nonetheless appeared among

several focus groups. The primary concern over food processing was loss of nutrients, while concern over pesticide use and food additives reflected potential physiological consequences of the chemicals themselves. These factors became a more significant theme when cancer was discussed specifically, indicating that people may perceive a more significant relationship between these factors and cancer than other diseases. Also, it is interesting to note that the dietary factors most frequently associated with cancer were not factors the participants could completely control. In other words, food processing and pesticide use reflect a greater concern over the food industry's influence than the influence of the individual's food choices. The influence of heredity also was a predominant theme regarding a person's risk for cancer, and also can be considered an uncontrollable factor. It is therefore significant to note that the majority of participants felt limited in their capabilities to control their risk for cancer.

Finally, though the majority of people felt their eating habits were the most influential factor linked to disease risk, those who made claims at attempting dietary related behavior changes most often had experienced disease either themselves or through a loved one. Often testimonials of improved health status as a result of changing eating habits appeared to reveal a strengthened belief in the idea that nutrition and disease are related.

Nutrition Knowledge Versus Practice

General phrases used by focus group participants to describe healthful eating practices, such as "eat right" and "balanced meals," are frequently used in the media, and it should be considered whether or not they can become part of a programmed response when asked about healthful eating, and not fully representative of actual knowledge or practices. Furthermore, definitions of "balanced eating" and "eating right" may be relative to the individual and not inclusive of the recommended five servings of fruits and vegetables daily. For instance, despite the fact that fruit and vegetable consumption was a major theme regarding the perceived habits of a healthy person, later questioning about health practices revealed that the majority of the participants were not meeting recommendations. This may suggest either an inconsistency between knowledge and practice of disease preventative behaviors, strong behavioral barriers, or it illustrates either inaccurate or a lack of specific knowledge concerning the meaning of general terminology and/or current dietary recommendations. In other words, either people who are knowledgeable about disease-

preventive practices are not willing to practice them, they think they are practicing them when they are not, they do not know how to enact disease-preventive behaviors, or they do not feel they are able to practice them. In any case, fruit and vegetable consumption within the research population was sub-optimal, and nutrition knowledge displayed was limited.

Lack of knowledge of the “5 A Day” campaign also illustrates a need to promote nutrition knowledge interventions in this population. While it has been shown that knowledge alone may not necessarily elicit behavior change, an intervention intending to change knowledge may elicit a change in a stage of behavior change (Contento et al., 1995). For instance, if people are not aware of the influence of dietary habits on preventing cancer, they are not empowered to contemplate behavior change.

In any case, messages from intervention efforts can target knowledge by making behavioral goals simple and attainable with catchy, memorable phrases. The “5 A Day” campaign is an example of this, despite the fact that it had not reached these audiences. Another excellent example of such a message that *had* reached one focus group participant was the idea of “the 3 B’s: bake, broil, and boil” for food preparation. Messages such as these serve to increase both awareness and knowledge. In addition, message simplicity can help increase perceived feasibility of behavior change.

Interventions Can Influence Health Locus of Control

In social theories of behavior change, perceptions of an external health locus of control have a strong impact on behavior and result in apathy towards behavior change (Bandura, 1986). In order to make positive behavior changes, it is necessary not only for a person to feel a perceived threat from the disease, but also that the change will have a significant effect on the outcome. When a person believes that the most influential factors affecting the outcome are beyond their control, behavior change is less likely to occur (Bandura, 1986).

When participants were asked about their concerns for cancer, it was clear that most participants felt a strong perceived threat of disease. However, while concern for the influence of dietary habits on disease risk was a predominant theme, it was interesting to note how frequently issues beyond their control were mentioned as potential disease-causative agents. Concern for the influence of heredity, food processing, food preservatives, and pesticides were all predominant themes regarding concern for the risk of cancer. Addressing

factors that participants perceive as beyond their control is an important part of an intervention intended to change behavior. For example, comments regarding the effects of food processing and chemical use indicated a certain degree of uncertainty about how exactly these factors affect the nutritive value of food, and could be a topic of discussion in educational interventions. Dispersing myths regarding these topics could ultimately help to re-focus health locus of control from uncontrollable factors to controllable ones. For example, an intervention effort could focus on the overwhelming evidence of the benefits of phytochemicals in preventing disease versus the lack of scientific evidence on the disadvantages of pesticides causing disease. In addition, it may be empowering to provide statistical information regarding how many cancers may be attributed to dietary habits, and how much heredity plays a role.

Understanding the Nutrition-Cancer Link

Conversation indicating a low health locus of control, in addition to comments from participants who had not previously realized a link between nutrition and cancer revealed that too few intervention efforts have focused on cancer prevention. As one person stated, he had heard of a dietary connection to heart disease and diabetes, but not to cancer. Only a few select people were able to verbalize the benefits of fruits, vegetables, and fiber regarding cancer, but the majority of the conversation concerning specific diseases focused on heart disease, diabetes, hypertension, and hypercholesterolemia.

It is important to take into consideration that diseases other than cancer have signs and symptoms that are in some sense measurable. They therefore have “visibility” for the person affected. For instance, as risk for heart disease and diabetes increases, a person may feel short of breath from impaired cardiac circulation, dizzy from hypoglycemic episodes, or have headaches from hypertension. Similarly, high blood cholesterol readings may trigger concern over health. However, for cancer there are no diagnostic tests for risk or preceding signs or symptoms, and many people do not perceive an immediate threat strong enough to induce thoughts of initiating preventive behaviors. This makes designing influential educational interventions for cancer more difficult. If people cannot feel signs and symptoms, understanding disease mechanisms is difficult. If people cannot understand disease mechanisms, it is also difficult to feel a sense of control over risk for cancer. Educational interventions targeting cancer would benefit from clearly yet simply illustrating

potential mechanisms for dietary causes of cancer. It may be beneficial to emphasize how specific disease-preventive habits already being taught in conjunction with other diseases also may be cancer-preventive.

Other important aspects of the nutrition-cancer link include fiber, phytochemicals, antioxidants such as beta-carotene, and specific vitamins and minerals such as C, E, and selenium. With the exception of fiber and beta-carotene, none of these factors were mentioned during focus groups. Only a couple of participants mentioned fruits and vegetables in terms of cancer prevention. With the abundance of positive scientific information regarding these topics, increasing knowledge with interventions may also serve to increase perceived control over risk for cancer.

Research Question 3: Perceived Benefits and Barriers to Fruit and Vegetable Consumption

This research was justified by the fact that previous research has demonstrated how barriers are more influential than benefits in predicting health-related behaviors. Therefore, perceived barriers are appropriate subject matter for educational interventions, especially for audiences with limited incomes and educational levels (Dittus et al., 1995). On the topic of benefits, comments were general in nature and the majority reflected a perception of immediate health benefits, such as “keeping you regular,” as opposed to long-term benefits such as disease prevention. Few people mentioned benefits of specific nutrients, which included only fiber and beta-carotene. Interestingly, when asked what type of information they would like in a newsletter, the specific benefits of fruits and vegetables were a predominant theme indicating an interest and desire for this information.

In terms of barriers, the most predominant perception was that pleasurable eating was not healthful, and people were more likely to make choices based on taste. This is consistent with the findings of a recent survey of American adults, which revealed that taste and cost were more important predictors of food choices than nutrition (Glanz et al., 1998). Numerous comments reflected that because “comfort foods” taste better than fruits and vegetables, people consumed less than recommendations.

Other predominant barriers perceived by focus groups included the difficulty of breaking routines, time constraints, and budget constraints. Several comments including phrases such as “you need to train yourself to eat [fruits and vegetables],” and “you have to

program your mind to do it every day” indicated a perception that dietary-related behavior change was a difficult process involving more than nutrition knowledge. It may therefore be desirable to include some simple behavior changing strategies that will be perceived as requiring minimal effort. Comments about cost reflected concerns about the initial expense of buying fresh produce. This as well as the added expense if produce was inedible or spoiled before consumption were deterrents to meeting recommendations. Thus, information about cost effective ways to purchase and prepare produce may be helpful in encouraging consumption.

In conclusion, research findings that taste and cost are more important factors in making food choices than nutrition (Glanz et al., 1998), as well as other recent literature suggesting that barriers are more influential than benefits in predicting behavior (Dittus et al., 1995), support the concept that interventions may be more successful by promoting taste, ease of preparation, and cost benefits than nutritional benefits of fruit and vegetable consumption.

Research Question 4: Daily Health Routines of Blue Collar Workers

A third justification for this research was that understanding the lifestyles and habits of a target audience is crucial to tailoring educational materials so that they will be perceived as useful. Therefore inquiries were made concerning the number of servings consumed in an average day, most frequent preparation techniques, and buying habits.

The finding that approximately 75% of participants self-reportedly consumed between two and three servings of fruits and vegetables daily was consistent with national findings from 1999 USDA reports (Tippett & Cleveland, 1999). Of the small percentage of people who reported consuming greater than five servings daily, most had experienced a “scare,” encountering disease either themselves or through a loved one.

In terms of preparation, raw fruits and salads were a popular choice. The most prominent preparation techniques for vegetables included reheating frozen and canned products, either on the stove or in a microwave. Few people attested to stir-frying, broiling, or grilling fresh vegetables. Restaurants and buffets were mentioned frequently throughout focus groups

Grocery stores were more popular than markets for purchasing, and only a small handful of people had time to grow their own gardens.

Potential Target Populations

In designing and distributing educational information, it is helpful to target populations who are most ready and willing to receive information. The fact that the impact of disease was influential in increasing fruit and vegetable consumption to recommended levels in some participants suggests that older adults are appropriate targets due to the fact they are more likely to have seen the impact of disease, either on themselves or a loved one. Older adults may therefore be more likely to sense an urgency to adopt preventive practices, as well as exhibit receptiveness to educational information.

Subject Matter for Interventions

The popularity of raw fruits and salads, as well as canned and frozen vegetables suggests the importance of convenience within this population. With preparation efficiency as the common factor, ideas consistent with current practices can be combined with new ideas to encourage adopting new practices. For instance, encouraging ways to increase consumption frequency of canned and frozen vegetables may be perceived as more useful than ideas using time consuming recipes or cooking techniques. For example, adding frozen blueberries to oatmeal, frozen broccoli to macaroni dishes, or canned corn to canned soups are all simple ways to increase fruit and vegetable consumption within an existing routine. In addition, innovative, time-efficient ideas such as preparing “veggie ka-bobs” as meat is grilled should also be included.

National data has indicated that the largest proportion of vegetables consumed by individuals are starchy vegetables, mostly as white potatoes (Frazao, 1999). While the types of vegetables consumed were not explored by this research, the fact that french fries are the most predominantly available vegetable at fast food restaurants, as well as the low cost of white potatoes suggests that starchy vegetables are most likely frequently consumed in the blue collar population. Considering the increase in risk of diabetes as adults age, as well as the limited nutritional value of starchy vegetables (especially when highly processed as in frying), it may be important to include information about starchy vegetables in an intervention aimed at reducing risk for cancer. It is important to clarify that consuming three out of five recommended produce servings per day in the form of white potatoes is not

consistent with cancer preventive strategies. Examples of potential intervention topics include portion controlling the starchy vegetables in cases where carbohydrate and/or weight control are desired, incorporating leafy greens in mashed potatoes to improve nutrient content, replacing white potatoes with sweet potatoes to increase nutrient intake, and focusing on recipes that incorporate “non-starchy” vegetables in the diet. Other ideas relevant to this population include information about making healthful decisions at a buffet, as well as recipes on how to improve the nutritional value of “comfort foods” such as mashed potatoes, potato salad, and cole slaw.

Research Question 5: Perceived Useful Educational Strategies

A final important rationale for this research was to determine what types of educational strategies the blue-collar population perceives as useful. Participants were asked where they have previously received information, what types of interventions they prefer, and what topics relevant to nutrition and cancer they would like to see in a newsletter.

The primary reason for questioning participants about where they have previously received nutrition information was to gain insight into strategies that have successfully penetrated this population. Answers were categorized as either “interactive,” in which educational material was presented in a class, workshop, or health fair type setting where they would be able to ask questions, or “non-interactive,” where information would have been passively obtained. Overall, interactive sources, such as worksite programming and physicians, were mentioned more frequently than non-interactive sources such as television, magazines, and radio. Furthermore, those that mentioned interactive sources were more likely to mention specific details regarding the information they had received. This suggests that information presented through an interactive intervention may be easier to recall, and the fact that these methods had already successfully influenced the population supports the effectiveness of interactive programming.

Despite the fact that the doctor’s office was perceived as a significant source of information, many participants did not feel physicians were a reliable source. Physicians were mostly perceived as lacking “how to” knowledge. However, comments regarding nurses, dietitians, and nutrition specialists providing information through Extension offices, worksites, health departments, and churches did not reflect the same skepticism. This

suggests that community interventions may be crucial to providing information aimed at reducing risk for disease.

While participants reported that most of their nutrition information had previously been received through interactive formats, when asked how they would like to receive future information, three of the four most desired educational methods were non-interactive sources including television segments, newsletters, and magazine/newspaper articles. Participants also indicated that worksite interventions were desirable, suggesting that the workplace may not only be an appropriate place to hold interactive interventions, but also to supply non-interactive “self-help” materials.

When focus groups were asked specifically what topics they would like to see featured in a newsletter series concerning nutrition and cancer, suggestions were extremely varied making it difficult to formulate “major” themes from responses. Overall, there appeared to be a strong interest in obtaining more information about how nutrition relates to various disease states. While most people suggested ideas pertaining to heart disease and diabetes, the lack of knowledge concerning the cancer-nutrition link as revealed by earlier focus group questions should not be ignored. This suggests the possibility that others may not know enough about the nutrition as related to cancer to formulate questions on the matter. In addition, focus group conversation in itself generated many questions about the specific benefits of fruits and vegetables with regards to different health conditions. Finally, there was a strong interest in obtaining practical information such as recipes, menus, cooking techniques to improve nutritive value, and how to cook new and different types of produce.

Application for Nutrition Interventions

A primary purpose for conducting these focus groups was to determine what types of topics would be appropriate for an educational intervention regarding nutrition and cancer prevention. Several potential topics for nutrition education interventions have already been mentioned in discussion, and were suggested based on either misinformation or lack of nutrition knowledge evident during focus group conversation. Participants also were asked directly what topics they would like to receive in a newsletter. A summary of potentially appropriate newsletter topics is illustrated in Table 4.

Table 4
Potential Topics for Educational Interventions Regarding Nutrition and Cancer Prevention

1. Mechanisms of cancer initiation and prevention
2. What are phytochemicals, and where are they found?
3. What are antioxidants, and where are they found?
4. Which vitamins and minerals help prevent cancer, and where are they found?
5. The influence of heredity vs. the influence of a healthful diet.
6. How harmful are pesticides?
7. Ways to help wash pesticides from produce.
8. How processing affects the nutritive value of food.
9. Nutritive value of fresh vs. frozen vs. canned fruits and vegetables.
10. Lycopene: a phytochemical formed in processed tomato products.
11. Top 10 ways to break a bad habit.
12. Maximizing time: recipes for preparing food ahead for the week.
13. Recipes for reducing fat and calories in “comfort foods.”
14. Cheap meals: eating dried beans and grains for pennies a week.
15. Most healthful “convenience foods.”
16. Top 10 “health foods” and how to incorporate them into your week.

Note. All topics are suggested based on either misinformation or lack of information evident from focus group conversation. Highlighted topics are suggested based on directly asking participants what they would like to see in a newsletter.

Recommendations for Future Research

Though few problems were encountered during this research effort, there are several factors to consider for improving future efforts. Employing Extension Agents is a resourceful way to coordinate a research effort covering a broad geographical area. In addition, it relieves the researcher of some logistical responsibilities such as recruitment, room reservations, and refreshments. However, in order to improve the outcome of focus groups, it is important to consider several factors during recruitment. When recruiters contact human resource personnel to recruit participants, it should be stipulated that to qualify for participation, recruitment should be done on a voluntary basis, and workers should not be penalized for participating. For instance, workers who are forced to clock out for participating do not make willing participants. These factors will ultimately affect focus group data.

Secondly, it is important to consider workplace policies when recruiting. Many places have implemented non-discriminatory policies requiring that anyone who volunteers must be allowed to participate. This affects a focus group moderator's ability to turn away potential participants when maximum group size has been achieved. Groups larger than 12 participants tend to affect data quality (Kreuger, 1994).

Though worksites are a convenient arena to perform community research, they provide an environment where the participants are more likely to know each other and influence one another's responses to questioning. If time and resources permit, it would be beneficial to solicit participants from the community randomly with personalized letters of invitation. Access to this information may be more difficult, but this would provide for an environment where participants are less familiar with one another, and make group numbers easier to control.

As previously stated, national data has indicated that the largest proportion of vegetables consumed by individuals are starchy vegetables, mostly as white potatoes (Frazao, 1999). While the "5 A Day" campaign does not clarify the types of vegetables that contribute the most health benefits, national dietary guidelines promote eating a variety of foods for optimum health. Therefore, it may be beneficial when conducting research regarding produce consumption to determine what percentages are consumed as starchy vegetables. Educational efforts should make the importance of variety clear. It may even be

beneficial to classify foods made from white potatoes as part of the grains group since they contribute a significant amount of energy to the diet.

One major outcome of this research was the development of a newsletter series intervention concerning nutrition and cancer prevention. Pre and post-intervention surveys will be conducted in an effort to determine intervention effectiveness and perceived usefulness. The results may ultimately be used to improve upon future interventions.

Research Limitations

Limitations of the focus groups includes a discussion of the general mood, factors influencing the focus group dynamics, and factors potentially affecting analysis of focus group conversation.

Factors Affecting Focus Group Dynamics

A total of seven women were recruited at an Accomack County Perdue Processing Plant. The group appeared to generate both curiosity and uncertainty. Though they seemed willing to participate, most were very shy. Some participants had difficulty reading indicating low literacy levels within the group.

The second focus group conducted in Accomack County involved 14 male workers at the Transportation Department recruited to participate before work hours in the early morning. Shyness was not a problem for this group. There appeared to be a strong sense of camaraderie, and they tended to make frequent jokes at another's expense. They seemed to be glad to participate despite having to come in early. The literacy level of this group appeared higher as several participants indicated they read their own nutrition information, and no one needed help with reading activities.

Seven women from a Peninsula area Food Bank comprised the third group. The recruiter for this group had a difficult time finding participants, and seemed to be rounding them up at the last minute. These women appeared slightly older than the first group, and only a few of them continued to work on a full time basis. Once discussion started, everyone appeared relaxed and without time constraints. Almost everyone was willing to contribute and did so on a fairly equal basis. One participant did get up to leave shortly after the discussion started. Literacy levels appeared fairly high, and no one needed assistance with reading activities.

The fourth group consisted of nine men at Potomac Supply Company in Lancaster County. Much like the transportation department in Accomack County, these men seemed glad to participate and exuded camaraderie with one another. A few members of the group appeared to exhibit difficulty reading and understanding questions, and were shy to participate compared with other group members.

The group of 11 women at a Lancaster County Levi's factory presented the most difficult focus group environment. The atmosphere was tense, and most of the women were closed and shy when posed with questions. It was discovered later that they were forced to clock out for the interview. They were losing pay and time needed to meet their production quotas to meet with us. Overall the conversation did not flow well and contained long periods of silence. A few dominant talkers tried to fill in when silence ensued, but often with answers of limited length. Overall, group participation was poor and very unequally distributed.

The final focus group conducted consisted of 19 men from Chesapeake Buildings and Grounds Division. These men were strongly encouraged to participate by their supervisor, and turnout was excessive. Almost all group members were active, willing participants in a curious atmosphere.

Factors Influencing Focus Group Dynamics and Data Analysis

During the first group, a participant arriving late accidentally pulled the extension cord, stopping the tape recorder a few minutes after conversation began. Hand-written notes were used to recall major ideas, however few direct quotes were recovered. Therefore data from this focus group was limited.

As stated previously, it was the intent to use the first two focus groups to pilot test the questioning routes. After the first two groups, several questions were re-worded and one was omitted due to problems with participants understanding questions or straying excessively from the desired topic. Changes in questioning routes limited the ability to compare conversations in the first two groups with the remaining groups, though data from questions used consistently throughout all groups was analyzed.

Each group was homogeneous in terms of gender and place of employment. Since the members of each group worked together with the exception of the women at the Peninsula Food Bank, most participants knew each other. This might have influenced some

peoples' desire to speak at times. At the same time, most participants were glad to use work time to participate, and the familiarity of co-workers created a fun, comfortable environment. One exception as previously mentioned was the Levi's factory where the women were forced to clock out to participate. The atmosphere in this group remained quiet throughout. Participation was poor, limiting the quality of the conversation data.

The Transportation Department and the Buildings and Grounds division both had unusually large groups with 14 and 19 participants, respectively. Workplace policies required that focus groups be open to anyone desiring to participate so as not to appear discriminatory. This limited our ability to control group size. While group size did not seem to inhibit anyone's willingness to participate, a limited time factor made it difficult to hear responses from everyone. Two participants from the Transportation Department tended to dominate conversation. Though tape recorders were placed at each end of the tables to better record all conversation, simultaneous talking made voices difficult to hear at times during transcription. While the camaraderie within these groups was strong, there was often a lot of "joking around" while others were trying to speak. It sometimes became difficult to keep the conversation focused on the topic, and again tapes were difficult to understand in places. Aside from these factors, overall participation in these two groups was excellent.

Finally, one participant from the Lancaster County Potomac Supply Company group was a supervisor who came out of curiosity. He was apparently younger than the age stipulated by the recruitment message, was more educated than the other participants, and was one of the dominant talkers of the group. It is possible that his contribution may have kept others from speaking out somewhat, but overall he appeared to be a good stimulant for conversation, and several group members had reactions to his comments. For this reason his contribution was used in data analysis despite his age and education.

Overall, the most significant problems affecting data collection occurred with two of the three groups of women, limiting the amount of data contributed by women to one focus group. Of the quality data retrieved, four focus groups were comprised of men, and one was composed of women. Therefore conversation analysis by gender was not performed.

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APPENDIX A

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Informed Consent for Participants of Investigative Projects

Title of Project: Using Focus Groups to Determine Blue-Collar Workers Perceptions Regarding Dietary Practices and Cancer Prevention.

Investigators: Kathleen M. Stadler, Ph.D., Instructor, Department of Human Nutrition, Foods and Exercise, Extension Specialist in Foods and Nutrition, and Julie M. Almond, graduate student in Human Nutrition, Foods and Exercise.

I. The Purpose of This Project

Dietary habits are strongly correlated with risks for developing diseases such as cancer. Some habits have been identified as increasing one's risk for disease, while other habits have been found to be protective against disease. Nutrition information about how to prevent disease is often confusing and difficult to interpret for working adults who have little time to read all the available information. One way to help adults eat healthier is to provide them with short, concise educational materials that convey messages adapted to the lifestyle and needs of the working population. We are trying to develop nutrition education materials that working adults will find useful and applicable to their needs.

II. Procedures

We have asked that Virginia Cooperative Extension Agents help us locate potential participants for this study. You were sent a letter inviting you to participate. You will answer questions in a focus group of specifically selected people regarding your concerns about nutrition and disease, and how you would like to receive educational information on these issues. Focus groups will be tape-recorded and will last approximately an hour. Audio tapes will be transcribed after recording, and data will be studied for patterns.

III. Risks

There are no known risks to studying human subjects in this research project. You may answer questions at your discretion.

IV. Benefits

Information gathered will be used to develop Extension publications and curricula by state and federal Cooperative Extension Service grants, or foundations that focus on chronic disease research such as American Cancer Society. No guarantee of benefits has been made to encourage you to participate.

III. Extent of Anonymity and Confidentiality

The discussion from the focus groups will be audio-taped, and your local Extension Agent will take notes during the questioning. Confidentiality regarding your answers will be protected by removing identifying names from the transcripts of the tape-recorded answers. The key to the code of participants, the tapes, the computer disks, and the hard copy of the focus group answers will be kept under lock and key. Information from the recorded focus groups will be destroyed two years upon completion of research.

IV. Compensation

Beyond a thank-you gift, there is no compensation for participating in this study. We offer you our sincere thanks.

VIII. Approval of Research

This research has been approved, as required, by the Institutional Review Board of 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 voluntarily agree to participate in this study. My responsibilities are to answer questions asked during the focus group session.

Signature of Participant/Date

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

Julie Almond (540) 231-7708
Graduate Assistant
Department of Human Nutrition, Foods and Exercise
Virginia Tech

Kathleen Stadler, Ph.D. (540) 231-8768
Extension Specialist
Department of Human Nutrition, Foods and Exercise
Virginia Tech

APPENDIX B

INTERVIEW GUIDE FOR FOCUS GROUPS

Good afternoon and welcome to our session. Thank you for taking time to join our discussion on nutrition and disease issues for a working adult population. My name is Kathleen Stadler and with me is Julie Almond. We represent the College of Human Resources and Education and Virginia Cooperative Extension from Virginia Tech in Blacksburg.

There is a need to understand the issues that working adults are concerned about related to nutrition habits and disease prevention. Also, we need to understand preferences that people might have about obtaining information and education concerning these issues. You were invited to participate in this meeting because you are a person whom we felt could help us gain some valuable insights into how we might accomplish these goals.

We believe that each of you have opinions that are very important for us as educators to understand. Therefore, we would like to encourage each of you to feel free to express yourself. There are no right or wrong answers to the questions we will be discussing. Today, we just need to know your concerns about nutrition and overall health and your preferences when receiving educational information related to disease issues and nutrition. You may notice that your feelings and perceptions differ from someone else's in the group. Please share your feelings even when they differ from someone else's. We are just as interested in hearing negative comments as we are in hearing positive comments. We will discuss this further in a few minutes.

Please speak up and we ask that only one person should talk at a time. We are tape recording the session because we don't want to miss any of your comments.

We'll be on a first name basis, and in our later reports there will not be any names attached to comments. What you say in this discussion will be kept confidential. We will only be using the tape recordings and notes to prepare a summary of all the sessions that will be conducted.

My role here is to ask questions and listen. I won't be participating in the discussion but I want you to feel free to talk with one another. There is a tendency in these discussions for some people to talk a lot and some people to not say too much. But it is important for us to hear from each of you tonight because you have different experiences. So if one of you is sharing a lot, I may ask you to let others talk. And if you aren't saying much, I may ask for your opinion.

If at any time you need a break or have a question, please feel free to tell any one of us. Let's get started.

1. First, let's go around the group. I'd like each of you to tell us your first name, where you live, and what your favorite fruit or vegetable is.

As I've explained, our discussion today will focus on how the food you eat, especially fruits and vegetables, is related to your overall health and risk for some diseases. Let's start with health.

2. When you hear the term “healthy person,” what comes to mind as far as what a “healthy person” eats?

PROBE: Related to exercise?

3. How do you feel your eating habits influence your overall health?
4. What are your concerns for developing a disease such as cancer?

Let’s talk more about eating fruits and vegetables.

5. What are some fruits and vegetables you’ve eaten in the past day?

PROBES:

How were they served or prepared?

Where did you buy your fruits and vegetables?

How many of you have your own gardens?

6. What are some advantages to eating fruits and vegetables?

PROBES:

What are some things you do to try to eat more of them?

What types of things keep you from consuming fruits and vegetables?

7. How many fruits and vegetables do you feel you need to eat a day to be healthier?
8. Where and from whom do you get your nutritional information regarding fruits and vegetables in the diet?
9. What type of educational information or programs would help you increase your consumption of fruits and vegetables?

10. Our goal in this project is to promote a healthier diet by eating more fruits and vegetables.

What type of information would you like to have about diet and disease if you were to receive a newsletter?

PROBES: regarding disease and diet? Fruits and vegetables and disease?

Appendix C

Focus Group Activity

Date _____

(Please do not write your name)

We are interested in knowing how you prefer to receive educational information about nutrition. Please choose the top three methods you would prefer, and rank them either 1, 2, or 3, with 1 being your most preferred method.

_____ Newsletter Series

_____ Brochures

_____ Magazine/Newspaper Articles

_____ Television Segments

_____ Video Tapes

_____ Community Nutrition Classes (If you prefer this method, please indicate the length of class time you prefer by circling one of the following:
30 minutes 45 minutes 60 minutes)

_____ Worksite Nutrition Program

_____ Other (Please Specify) _____