DISSERTATION

Good Grubbin': The Development and Evaluation of a Nutrition-Oriented Cooking Show on a College Campus

Submitted by

Dawn Elizabeth Clifford

Department of Food Science and Human Nutrition

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WE HEREBY RECOMMEND THAT THE DISSERTATION PREPARED UNDER OUR SUPERVISION BY DAWN ELIZABETH CLIFFORD ENTITLED GOOD GRUBBIN': THE DEVELOPMENT AND EVALUATION OF A NUTRITION-ORIENTED COOKING SHOW ON A COLLEGE CAMPUS BE ACCEPTED AS FULFILLING IN PART REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY.

Committee on Graduate Work

Garry Auld, Ph.D., R.D.

Mary Harris, Ph.D., R.D.

Jeffrey Miller, Ph.D., C.E.C., C.C.E.

Joseph Champ, Ph.D.

Advisor, Jennifer Anderson, Ph.D., R.D.

Department Head, Chris Melby, Dr.P.H.

ABSTRACT OF DISSERTATION

GOOD GRUBBIN': THE DEVELOPMENT AND EVALUATION OF A NUTRITION-ORIENTED COOKING SHOW ON A COLLEGE CAMPUS

The college-aged population has unique barriers to adopting healthful eating habits and often lacks the knowledge, skills, and self-efficacy needed for basic meal planning. This is thought to contribute to students' diets which are inadequate in fruits and vegetables and high in dietary fat, cholesterol and sodium. Previous research supports that students prefer to obtain nutrition information through the mass media. The use of media channels on college campuses may be an un-tapped source for delivering health information to college students. The objective of this research was to determine an appropriate campus-specific mass media channel for delivering nutrition information and to develop and evaluate the impact of a televised cooking program on the diets of college students.

A needs assessment survey was conducted with undergraduate students in a freshman-level core curriculum anthropology course to determine media channel preferences, and topic interests. While television was ranked as the most preferred media channel for obtaining nutrition information, the newspaper was the highest utilized campus-specific media channel. Students were more interested in reading articles on nutrition in the campus newspaper than using other proposed campus media sources. Of the 169 respondents, 87% reported interest in reading a weekly article about nutrition, exercise, and cooking techniques in the college newspaper. Students were most interested in gaining information from the media on meal planning, cooking, and shopping. Upon

further exploration of developing a media-based nutrition intervention with the campus newspaper, campus media policies prevented the printing of a weekly newspaper column on nutrition. Based on students' interest in television as a medium for obtaining nutrition information, and the accessibility of the campus television station, this media channel was selected for a nutrition intervention.

A pilot nutrition-oriented cooking program was developed in collaboration with the campus media station at Colorado State University. Students were recruited from a core curriculum health class to participate in four female and four male focus groups to assess the appeal of the pilot program. Findings suggested that students relate best to peers viewed in their natural environment with minimal scripted scenes. They preferred health messages in which someone was not talking at them, but rather demonstrating the skills necessary to incorporate nutritious foods into their meals and snacks. The cooking scenes were well-received by student audiences and included recipes that they felt were simple, and realistic. Results from these focus groups support the recent trend in the popularity of cooking shows and reality television for young adult audiences.

Four 15-minute episodes of Good Grubbin', a theory-driven (Social Learning Theory) cooking program, were developed. This program was aimed at college students living off campus and was designed to influence students' knowledge, attitudes, and behaviors regarding eating fruits, vegetables as well as cooking skills and meal planning. Students were recruited from upper-level non-health courses to participate in a randomized control trial with pre, post and follow-up tests. The intervention group (n=50) watched four weekly episodes of the cooking show, Good Grubbin'. The control group (n=51) watched four weekly episodes on sleep disorders. Changes in knowledge,

attitudes, and behaviors regarding eating fruits, vegetables, cooking and meal planning were assessed using a FFQ and a personal factors survey. A program feedback survey was used to determine acceptance of the show series by the target audience. There were significant improvements in knowledge of fruit and vegetable recommendations in the intervention group compared to the control group post intervention and at 4-month follow-up ($p<0.05$). The intervention group had no significant changes in attitudes or behaviors surrounding fruits, vegetables and cooking at follow-up. The cooking program was well-received by the target audience with 61% of students in the intervention group reporting an interest in viewing additional episodes of Good Grubbin'.

A television show on nutrition and cooking may be influential in changing students' knowledge, but seems to have little impact on dietary behaviors. With a recent increase in popularity of cooking shows, future research should investigate the impact an extended cooking and nutrition show series might have on young adult viewers.

Dawn Elizabeth Clifford
Department of Food Science and Human Nutrition
Colorado State University
Fort Collins, Colorado
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INTRODUCTION

Public interest in nutrition has increased dramatically over the last several decades (Basch, 1987). In response to this interest, various mass media channels are inundated with food and nutrition information (*Food for Thought IV: A Report from the Nation's Media*, 2004). The information age poses challenges and opportunities to delivering health information; such opportunities can provide an avenue to address the quest for knowledge by college students. Consumers seek reliable nutrition information and often rely on mass media sources such as television, magazines, newspapers, and the Internet (*Attitudes, Knowledge, Beliefs, Behaviors: Findings of American Dietetic Association's Public Opinion Survey Nutrition and You: Trends 2002*, 2002).

College students are one target audience that could benefit from increased exposure to health information. Leaving home to attend college is a momentous occasion in students' lives as they begin to make independent decisions concerning their dietary and activity patterns. The college-aged population has unique barriers to adapting healthful eating habits. As they move away from home and begin independent living, they often lack the knowledge, skills, and self-efficacy needed for basic meal planning skills (Betts, Amos, Keim, Peters, & Stewart, 1997; Koszewski & Kuo, 1996; McArthur, Grady, Rosenberg, & Howard, 2000). Therefore, the diets of college students have been reported to be low in fruits and vegetables (Hertzler, Webb, & Frary, 1995) and high in dietary fat (Hertzler et al., 1995; Hoffman, 1989; Horwath, 1991; Y. Huang, Song, Schemmel, & Hoerr, 1994), cholesterol (Hoffman, 1989), and sodium. College students

have limited free-time (Betts, Amos, & Georgiou, 1995; Koszewski & Kuo, 1996), therefore reaching this audience with health information can be challenging.

A national health objective from *Healthy Campus 2010 (Healthy Campus 2010 Manual)* focuses on the need for nutrition and physical activity education in colleges and universities. Specifically, the objective is to increase the proportion of college and university students who receive information from their institutions on these topics. To achieve this goal, nutrition professionals employed on college campuses must seek innovative methods to disseminate health information.

Communication through the mass media can be an important component of health strategies designed to change health risk behaviors (Flora, Saphir, Schooler, & Rimal, 1997). Previous research suggests that college students prefer to obtain nutrition information from the media (Novascone & Hertzler, 1986). By using mass media interventions, health professionals can communicate information on diet and exercise to the student in a fast and efficient manner.

The use of media channels on college campuses may be an un-tapped source for delivering health information to college students. College campuses often have thriving campus-specific mass media outlets aimed at providing students with information on campus events as well as local, national, and world news. Approximately 1,300 universities across the country have campus media organizations (*American College Media Directory*). Large universities are likely to have a campus newspaper, television station and radio station. Mass media channels specific to a college campus have not been evaluated as a vehicle for providing nutrition information to college students.

Purpose

The purpose of this study is to determine appropriate methods for delivering a media-based nutrition intervention on a college campus and to assess the impact of a theory-driven intervention with concepts of nutrition and cooking on the knowledge, attitudes and reported behaviors of college student recipients. This was accomplished through conducting a needs assessment survey to determine students' media preferences for obtaining nutrition information, a formative evaluation of a pilot media-based nutrition intervention, and a final analysis of the effectiveness of the intervention. The objective of the media-based nutrition intervention was to provide students with the knowledge, skills and self-efficacy to plan and prepare meals and to increase their fruit and vegetable intake.

The following chapters represent a review of the literature, followed by three manuscripts. In the first manuscript the results from the needs assessment survey are described. The second manuscript represents data from focus groups that were conducted to determine audience acceptance of a chosen media-based nutrition intervention. The third manuscript includes results from a pretest-posttest control group design that determines the impact of the final intervention on the knowledge, attitudes, and behaviors of the college student audience. The three manuscripts are followed by a discussion of the results as well as conclusions and implications for future research.

Timeline

Needs Assessment Survey

Year 1: January 2003-December 2003

- Develop needs assessment survey

- Survey is tested for reliability and validity
- Collect and analyze survey data

Pilot Program Development, Formative Evaluation and Summative Evaluation

Year 2: January 2004-December 2004

- Explore campus media accessibility
- Determine pilot television program format and general themes

Year 3: January 2005-December 2005

- Hold auditions for actors/actresses
- Film and edit pilot program
- Recruit focus group participants
- Conduct focus groups
- Write scripts for four episodes that will be used in the final intervention
- Develop personal factors survey and refine FFQ
- Test reliability and validity of measurement tools
- Produce intervention episodes
- Recruit participants for the intervention
- Conduct randomized controlled trial with pre, post tests

Year 4: January 2006-December 2006

- Contact subjects and conduct follow-up tests
- Air the intervention television program on the Campus Television Station
- Analyze intervention data and report

CHAPTER 1: LITERATURE REVIEW

Introduction

The feasibility of using the mass media to influence health attitudes and behaviors has long been debated (Flora, Maibach, & Maccoby, 1989). Mass media has the potential to reach very large audiences (Flora et al., 1989) with health information and raise consciousness of these health issues (Wellings & Macdowall, 2000). However, the drawback for using mass media in health education involves the diversity and largely undifferentiated audience that these messages reach (Flora et al., 1989). A diverse audience makes it difficult to design media messages for particular target audiences. Furthermore, mass media interventions may not be effective in shifting attitudes, beliefs, and behaviors (Wellings & Macdowall, 2000).

Assessing the influences of media on health behaviors can be a challenging task. The potential for mass media interventions to reach a wide audience is paradoxically also the greatest challenge for evaluation (Wellings & Macdowall, 2000). It is challenging to control mass media interventions. There is less control over who receives the preventive messages conveyed by the mass media and how well the messages are understood. Furthermore, it can be difficult to track message exposure during an intervention.

Despite these challenges, researchers must continue to assess the influence mass media health interventions have on target audiences, as mass media channels continue to be a popular resource for health information (O'Keefe & Boyd, 1998). Researchers can improve their chances for success through developing rigorous study designs and using a

succinct evaluation process that includes formative, process, and outcome evaluations (Wellings & Macdowall, 2000).

While many studies have investigated the impact of mass media campaigns on the diets of audience members (Farguahar et al., 1990; Miles, Rapoport, Wardle, Afuape, & Duman, 2001; Sogaard & Fonnebo, 1992; Tuomilehto et al., 1986), no known research has been done to investigate the influence nutrition information obtained in the media can have on college students. This review of literature explores what makes college students an ideal target audience for media-based nutrition interventions, investigates the process of selecting the most appropriate media channels for dissemination, reviews previous research with televised nutrition education and relates how theory may improve the outcomes of media based research efforts.

Dietary and Cooking Behaviors of College Students

The dietary practices and nutritional status of college students are a concern to nutrition professionals. These concerns stem from research that suggests the diets of college students are nutritionally inadequate (Makrides, 1998; Melby, Femea, & Sciacca, 1986; "National College Health Assessment Survey," 2005; Sneed, 1991). Students would benefit from receiving nutrition information in a format that is both appealing and improves their self-efficacy to make recommended dietary changes.

Leaving home to attend college is a momentous occasion in students' lives as they begin to make independent decisions concerning their health. Students often make food choices based on convenience rather than nutritional value (Betts et al., 1997). Often students lack the time and skills to prepare healthful meals and snacks (Koszewski &

Kuo, 1996). In 1995, Betts and colleagues conducted focus groups to determine factors that affect food choices of young adults (Betts et al., 1995). They identified time constraints, lack of money, and health concerns as influencing food intake of both college students and the non-college population. Koszewski and colleagues surveyed college females in 1996 and found that 60% had inadequate time to prepare meals, 30% reported inadequate cooking skills, and 24% stated they had inadequate skills to get the most for their food dollar (Koszewski & Kuo, 1996). These barriers often result in poor diet quality.

Inadequate dietary intake of fruits and vegetables can result in insufficient ingestion of vitamins, minerals, and fiber. Researchers have demonstrated that college students consume inadequate servings of fruits and vegetables. In the year 2000, only 7.4% of college students nationwide reported consuming at least five daily servings of fruit and vegetables (Sneed, 1991). This is further supported by Makrides and colleagues who found that 82% of the 585 students surveyed ate less than the recommended amount of fruits and vegetables (Makrides, 1998). Melby and colleagues found that 69% of students failed to eat any fruit at least once a day and 43% of students reported they ate vegetables less than once a day (Melby et al., 1986).

The inadequacy of students diets was addressed by the American College Health Association (ACHA) in the year 2000 when nutrition-related goals were included in the report, *Healthy Campus 2010: Making it Happen.*(*Healthy Campus 2010 Manual*). One of the objectives of Healthy Campus 2010 is to "increase the proportion of college students who have received information on dietary behaviors and nutrition" (*Healthy Campus 2010 Manual*). According to the ACHA nationwide survey compiled in 2000,

32.7% of college students reported receiving information on dietary behaviors and nutrition while on campus ("National College Health Assessment Survey," 2005). In a study by Brener and Gowda, only 34.0% of women and 26.0% of men reported receiving nutritional information on college campuses (Brener & Gowda, 2001). The goal set by ACHA is that 55% of college students receive information on dietary behaviors and nutrition while on campus by the year 2010 (*Healthy Campus 2010 Manual*). In order to reach this goal, nutrition professionals employed on college campuses must seek innovative methods to disseminate nutrition information.

Media Channel Selection

Health care professionals should consider several factors when selecting the best channels for delivering messages to target audiences: a) channel preferences by the audience, b) likelihood of multiple message exposures, and c) affordability and access for health communicators (Arkin, Parvanta, & Maibach, 2002). In addition, health educators must consider the impact of media channels on the target audience (Schooler, Steven, & Flora, 1998).

Novascone and Hertzler recognized the mass media as a dominant communication channel for college students (Novascone & Hertzler, 1986). When students were asked to identify all primary sources of nutrition information listed on a questionnaire, they rated mass media channels as their primary sources of nutrition information. Magazines, television, and radio were the most popular media channels accessed.

In addition to channel preferences, health educators must also consider attention to the message as well as the likelihood of multiple message exposure. Health messages

can be sent through either print or electronic media (Goldberg, 1992). Each form of media offers advantages and disadvantages to disseminating information. Print media, such as newspapers and magazines are involving because they require the reader to pay attention. Also, the receiver can read at their own pace and reread passages if necessary (Flora et al., 1997). A medium's ability to involve the receiver affects the level of impact brought about by the intervention (Flora et al., 1997). Print media, in general, has low reach (Flora et al., 1997). Reach refers to the size of audience exposed to a medium's message while specificity refers to the extent to which a medium exposes a particular type of audience to a message.

The electronic mass media includes radio, television, and the Internet. Television is a stimulating medium because it is quick-paced and provides both verbal and visual stimuli (Flora et al., 1997). Television has a high reach, but it does not capture the viewers attention as viewers often participate in other activities while watching television. This lack of focus interferes with the viewer's engagement with and thoughtful consideration of televised messages (Flora et al., 1997).

Watching television continues to be one of the most popular American past-times. On average, Americans have their television sets on for nearly 8 hours each day, actively watching 3 to 7 hours (Johnson, 2001). While television has the potential to provide audiences with useful health information (Manoff, 1973), there is also the potential to promote unhealthful products and conflicting information ("Food and Nutrition Misinformation," 2002). Today, nutrition messages are more frequently found on the news, talk shows, cooking shows, infomercials, advertisements, and even buried in sit-coms, dramas, and movies.

The Internet can be both a stimulating and involving medium. Audio visual stimuli can increase interest, while interactive multimedia can increase involvement (Flora et al., 1997; Gould & Anderson, 2002). The Internet is one example of an interactive medium that can provide users with nutrition information.

Health educators must also consider the cost-effectiveness of a media channel. This is based on actual costs, the number of people reached, and the impact of the program on the individual (Austin & Husted, 1998). Media channels available on a college campus are often more affordable than alternative media options and can be a viable option for reaching college students with health information.

Clifford et al. at Colorado State University assessed campus-specific media preferences for obtaining nutrition information (Clifford, Anderson, & Auld, 2006b). They found that students prefer to obtain nutrition information through television above other mass media channels. When asked what their interest was in a proposed intervention that involved a weekly television program on nutrition and cooking on the local campus television station, 42% of the 169 respondents reported that they were interested in viewing such a program (Clifford, 2004).

While television production can come with a high price tag, the high reach makes this form of media potentially cost effective. On average, college students watch 24.3 hours of television a week (James, 2006). Therefore, the television may be an appropriate vehicle for providing college students with the information they need about nutrition and cooking.

Television and Nutrition Education

Several researchers have coordinated the development of televised nutrition education programs for specific target audiences. They have attempted to assess the effect these programs have on knowledge, attitudes and behaviors of study participants. In general these programs seem to increase public awareness and result in increased nutrition knowledge, but seem to have less of an impact on changing attitudes and behaviors then traditional forms of nutrition education.

One of the first attempts to explore the use of nutrition education materials on television was by Jenkins and colleagues in 1975 (Jenkins, 1975). They developed a series of nutrition education programs designed for fourth graders called *Mulligan Stew.* To evaluate the impact that the six half-hour nutrition education films had on the nutrition knowledge of fourth graders, they developed a survey that was given to participants both before and after the intervention. In addition, changes in dietary intake of the children were assessed using two three-day food records. They discovered that children who viewed the films and participated in supplemental activities increased their knowledge of nutrition significantly more than did control groups. However, according to food records, overall there were no significant improvements in dietary habits among the children exposed to the intervention.

Shannon and colleagues also found a significant change in knowledge when they exposed their participants to a one-hour television program called *Foodene* in 1979 (Shannon, Thurman, & Schiff, 1979). Fifty-eight men and women were self-selected from the community and randomly assigned to a treatment and non-treatment group. The treatment group viewed videotapes of the program in a controlled environment before

taking the survey, while those in the control group took the survey before viewing the videos. The treatment group scored 23% higher ($p = 0.002$) on the knowledge test than did the non-treatment group. Changes in attitudes and behaviors were not assessed in this particular study.

Puska and researchers used reported outcome measures to assess the impact of their television program about cardiovascular disease risk factors (Puska & McAlister, 1981). The Finnish television program, which included ten 30-minute programs, aired every second week during a four-month period in 1980. In addition, eight Finnish citizens at high risk for cardiovascular disease took part in the program and were asked to make behavior changes in front of the camera. They were followed throughout the duration of the program. Mailed surveys were collected from 4,711 (79% response rate) living throughout Finland. The self-reported effects were validated by a follow-up telephone survey of the respondents who reported either losing weight or quitting smoking. Forty-two percent of women and 32% of men reported following the program. One percent of men and 2% of women reported losing weight with the aid of the program. The average reported weight loss was 3.5 kg. In addition, 1% of men and 1.7% of women reported quitting smoking. Overall, the authors concluded that the viewer rates were high while the effect rates were limited.

Chew and colleagues investigated the long-term impact of the one-hour television program, *Eat Smart* (Chew, Palmer, & Kim, 1995). *Eat Smart* included messages about fat consumption and was aired on 289 public television stations in 1991. Individuals were randomly selected across the country to participate in 3 telephone surveys. This study was unique in that the television program was viewed by participants in their natural

setting and not in a laboratory. However, researchers did not include a control group due to budget restrictions. There was a significant increase in knowledge scores after viewing *Eat Smart*. These scores were still significantly higher five and half months later after viewing the program. In a second report in 1998, Chew and colleagues reported improvements in efficacy, health motivation, salience and confidence in information as well as reported changes in behavior after viewing the program (Chew, Palmer, & Soohong, 1998). They concluded that viewers appear to engage in healthful nutrition behavior when they have confidence in the correctness of their nutrition knowledge.

Television was also used to distribute nutrition information to remote areas in Native Alaskan communities (Smith & George, 2001). Smith and George conducted a study through a WIC office that served 11 villages in a 60,000 square miles area in Alaska. Fifteen 30-minute programs were produced featuring a central nutrition theme consistent with WIC project objectives. The television programs included testimonials from breastfeeding mothers, food demonstrations on the use of WIC foods, and interviews with nurse-midwives and health professionals. Changes in knowledge were measured using pre and post-tests. There was a significant change in knowledge in 9 of the 10 questions. This program also resulted in a 16% increase in WIC enrollment during the 6-month broadcast period.

From the studies mentioned above we can conclude that a significant advantage of nutrition education via television is the potential to provide audiences with accurate nutrition information. Whether this change in knowledge ultimately leads to changes in attitudes and behaviors is less clear. In general, these programs seem to increase public awareness and result in increased knowledge about nutrition, but seem to have less of an

impact on changing attitudes and behaviors then traditional forms of nutrition education (Chew et al., 1995; Chew et al., 1998; Jenkins, 1975; Puska & McAlister, 1981; Shannon et al., 1979; Smith & George, 2001). Additional research is needed that compares changes in knowledge, attitudes and behaviors in intervention and control groups.

The Social Learning Theory

It is evident that simply giving nutrition information through the television is not enough to initiate changes in eating behaviors. In order for television viewers to begin making the recommended dietary changes, they must learn how to overcome obstacles shaped by their environment and gain self-efficacy in their skills and abilities. Albert Bandurra, the founding father of the Social Learning Theory, suggests that our environment as well as the thoughts and events that shape our lives affect our dietary behaviors. Conversely, our behaviors shape our environment and our personal factors (Bandura, 1977).

The television can act as a symbolic environment as images viewed on television can impact behavior patterns and thought processes (Bandura, 2002). In the context of the Social Learning Theory, Bandurra states, "Whereas previously, modeling influences were largely confined to the behavior patterns exhibited in one's immediate environment, the accelerated growth of video delivery technologies has vastly expanded the range of models to which members of society are exposed day in and day out."

Televised modeling is now being used to effect social change at community and society wide levels. During observational learning, it is important that viewers see people similar to themselves changing their lives for the better. These images not only convey

strategies for how to do it, but raise television viewers' sense of efficacy that they too can succeed.

The Social Learning Theory includes seven constructs in all, that when applied can promote behavior change. These constructs are defined in table 1. In addition, examples are provided of possible strategies for incorporating these constructs into a television-based intervention.

Table 1. Social Learning Theory in Program Development

Theory Concept	Concept Description	TV Program Application
Reciprocal Determinism	Personal factors, behaviors and the environment in which one lives are all inter-related. The links among these three are interactional, i.e., they flow in both directions.	Television program scenery will include a variety of environments frequented by students including grocery stores and kitchens.
Observational Learning	Learning through watching others.	Cooking Demonstrations
Differential Modeling	Seeing people similar to themselves make positive dietary changes both conveys strategies for how to make the behavior change and raises television viewers' sense of efficacy that they too can succeed.	TV show talent will be similar in appearance to target audience members.
Vicarious Motivators	Belief in one's ability is influenced by watching others succeed or fail.	The positive outcomes of behavior changes made by TV characters will be emphasized.

Theory Concept	Concept Description	TV Program Application
Behavioral Capabilities	In order to achieve a behavior change, a person must have the skills that are necessary in order to successfully complete the desired behavior.	The TV program will provide students with skills to prepare, shop for, and plan healthful meals.
Expectations	Anticipatory outcomes of a behavior	Behavior changes made by actors on television will demonstrate potential barriers and positive outcomes viewers can expect when making the recommended dietary changes.
Expectancies	The values that the person places on a given outcome, incentives;	Actors will demonstrate that they value the benefits of making healthful dietary choices.
Self Efficacy	The person's confidence in performing a particular behavior	Television program viewers will see students like themselves making positive dietary changes. Student actors will make food preparation appear quick and easy.
Reinforcements	Environmental response to a person's behavior that increases or decreases the likelihood of reoccurrence.	Viewers will witness actors benefiting from the dietary changes they make on the show.

Summary

Several factors set this study apart from studies in the past that have assessed the effect of televised nutrition information. To start, this is the first study to investigate the impact of televised nutrition education on the college population. Second, this is the first

known nutrition program that relies on theory to guide the development of the intervention. This study may provide insight into how an intervention developed based on constructs of the Social Learning Theory can impact behavior change. Finally, this is the first known research to investigate the use of a cooking program format to deliver nutrition information. By demonstrating the skills to plan and prepare healthful foods in addition to nutrition knowledge, we provide audiences with an additional link to changing their behaviors. Furthermore, the western world has witnessed a boom in food television in the early twenty-first century (de Solier, 2005). Several countries now have entire channels devoted to food television (de Solier, 2005). Due to the recent trend in cooking programming, we must explore if this format is optimal for educating the public in nutrition.

CHAPTER 2: The Use of Mass Media Channels on a College Campus to Disseminate Information on Nutrition and Physical Activity

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ABSTRACT

Consumers seek reliable health information and often rely on mass media sources such as television, magazines, newspapers, and the Internet. The use of media channels on college campuses may be an un-tapped source for delivering nutrition and physical activity information to college students. The objective of this study was to determine the most preferred campus-wide mass media channel for providing such information to college students. The authors surveyed undergraduate students to determine channel preference, and topic interests. The newspaper was the highest utilized campus media channel. Students were more interested in reading articles on nutrition, physical activity and cooking in the campus newspaper than using other proposed campus media sources with 87% of the 169 respondents reporting interest in this intervention. College newspapers may be an acceptable yet underutilized medium for educating students on health issues.

Public interest in nutrition has increased dramatically over the last decade (Basch, 1987). In response to this interest, various mass media channels are inundated with food and nutrition information (*Food for Thought IV: A Report from the Nation's Media*, 2004). The media can play a powerful role in influencing health behavior (Flora et al., 1997). In studies of health campaigns in which media channels were used to disseminate information, behaviors in the intervention groups changed significantly when compared to the control groups (Farquahar et al., 1990; Reger, Woota, & Booth-Butterfield, 1999; Snyder et al., 2000).

College students are one target audience that could benefit from increased exposure to health information. Leaving home to attend college is a momentous occasion in students' lives as they begin to make independent decisions concerning their dietary and activity patterns. In general, college students have diets that are low in fruits and vegetables (T. Huang et al., 2003; Makrides, 1998; Melby et al., 1986). They often eat fast food (Beerman, Jennings, & Crawford, 1990; Cason & Wenrich, 2002), high fat, high sugar snacks (Lawrence & Schank, 1993), and frequently skip meals (Beerman et al., 1990; Cason & Wenrich, 2002; Lawrence & Schank, 1993). The student population is also relatively inactive (Beerman et al., 1990; Makrides, 1998; Melby et al., 1986; Pinto & Marcus, 1995).

A national health objective from *Healthy Campus 2010 (Novascone & Hertzler, 1986)* focuses on the need for nutrition and physical activity education in colleges and universities. Specifically, the objective is to increase the proportion of college and

university students who receive information from their institutions on these topics. To achieve this goal, nutrition professionals employed on college campuses must seek innovative methods to disseminate health information.

Before health messages can be delivered to any target audience, appropriate media channel selection must be carefully considered. Nutrition messages can be sent through either print or electronic media (Goldberg, 1992). A medium's ability to involve the receiver affects the level of impact brought about by the intervention (Flora et al., 1997). Print media, such as newspapers and magazines are involving because they require the reader to pay attention. Also, the receiver can read at their own pace and reread passages if necessary (Flora et al., 1997).

The electronic mass media includes radio, television, and the Internet. Television is a stimulating medium because it is quick-paced and provides both verbal and visual stimuli (Flora et al., 1997). However, television is not always as involving as viewers often participate in other activities while watching television. This lack of focus interferes with the viewer's engagement with and thoughtful consideration of televised messages (Flora et al., 1997). The Internet can be both stimulating and involving. Audio visual stimuli can increase interest, while interactive multimedia can increase involvement (Flora et al., 1997; Gould & Anderson, 2002).

Health care professionals should consider several factors when selecting the best channels for delivering messages to target audiences: a) channel preferences by the

audience, b) likelihood of multiple message exposures, and c) affordability and access for health communicators (Arkin et al., 2002). In addition, health educators must consider the impact of media channels on the target audience (Schooler et al., 1998). By using mass media interventions, health professionals can communicate information on diet and exercise to the student in a fast and efficient manner.

Novascone and Hertzler recognized the mass media as a dominant communication channel for college students (Novascone & Hertzler, 1986). When students were asked to identify all primary sources of nutrition information listed on a questionnaire, they rated mass media channels as their primary sources of nutrition information. Magazines, television, and radio were the most popular media channels accessed.

College campuses often have thriving campus-specific mass media outlets aimed at providing students with information on campus events as well as local, national, and world news. Approximately 1,300 universities across the country have campus media organizations (Jones, 2002). Large universities are likely to have a campus newspaper, television station and radio station. Mass media channels specific to a college campus have not been evaluated as a vehicle for providing nutrition information to college students. Not only are campus media channels accessible and readily available to students, but they can also lead to changes in attitudes and social norms on campus (Wechsler, DeJong, Shapiro, & Lavin, 1992). Media channels on college campuses are often student-run and provide student journalists an opportunity to report on topics that pertain to college student life including health, relationships, and culture.

The objectives of this study were to determine students' preferred campus-specific mass media channels for obtaining information on nutrition and physical activity and to ascertain students' interest in subject matter related to these health areas.

METHODS

Sample

One-hundred sixty-nine students in two sections of a freshman level core curriculum anthropology course at Colorado State University (CSU) completed a needs assessment survey in the Spring of 2003. We received Institutional Review Board approval to conduct this paper and pencil survey, and student consent was obtained.

Design

A needs assessment survey was developed to determine from which media channels college students prefer to obtain information on nutrition, cooking techniques, and physical activity. Two instructors of a freshman-level core curriculum anthropology course agreed to offer the survey to their students at the end of a lecture. Students completed the survey in the classroom and the data were entered manually.

Questionnaire Development

The needs assessment survey was assessed for content validity and reliability. Eight experts in the field of nutrition education and journalism established the content validity

of the survey to ensure all media channels were addressed. The panel of experts consisted of two professors and five graduate students in the Department of Food Science and Human Nutrition and one professor in the Department of Technical Journalism.

Reliability of the needs assessment survey was determined using a test-retest methodology (14 days apart) with 111 students in an introductory level nutrition class for non-nutrition majors. Students who agreed to take the test and retest were given ½ point extra credit towards their grade in the nutrition class. All questions were assessed for reliability using Pearson's correlations, percentage agreement, and paired *t* tests. All questions had correlations and/or percent agreements above .70 or 70%, respectively. Paired *t* test analysis showed no significant differences between the means at time one and time two. Groups of questions, based on common themes were verified using Cronbach's α.. Items that showed an inter-item correlation of > .70 were grouped together to create individual scales.

The final survey consisted of questions to assess student's demographics, media behaviors, attitudes regarding levels of trust in information obtained in the media, preferred media channels, and health topics of interest. For demographic information, respondents provided details on their age, gender, years of college, and place of residence while attending college. Students were asked to report the frequency with which they utilize each campus media channel by selecting from five responses: always (daily), often (weekly), occasionally (a few times per month), seldom (a few times per semester), and never. They were then asked to rank their level of trust in nutrition information

obtained from each mass media channel and select a response from a five-point scale ranging from "don't trust the information at all" to "trust all the information."

Students rated their preferences for obtaining nutrition information through various mass media channels. The question was stated, "How do you prefer to receive information about nutrition through the media?" Participants were instructed to rank each media channel on a three-point scale of less desirable, somewhat desirable, and more desirable. Respondents were then introduced to five potential campus media interventions. These interventions were proposed to provide information about nutrition, exercise, cooking techniques, and recipes via mass media channels on campus. The five potential interventions assessed were monthly emails, a series of 30-minute television programs aired on Campus Television, a collection of five-minute downloadable videos found on the university website, a radio program aired through the campus radio station, and a sequence of weekly articles printed in the college newspaper. Respondents indicated their interest in the proposed campus media interventions on a four-point scale, ranging from very interested to not at all interested.

Finally, students were asked to rate their interest in a list of 32 topics in the areas of nutrition, meal preparation, and physical activity. The question was stated, "Which of the following topics interest you?" Respondents could select from a three-point scale that indicated that they were very interested, somewhat interested, or not interested in each of the 32 topics. Topical areas included issues such as weight loss, heart disease prevention, bone health, eating disorders, easy cooking ideas, meal planning, and exercise tips.

Analysis

Statistical Package for the Social Sciences, version 12.0 (SPSS Inc, Chicago, Ill) was used to analyze the data from the needs assessment survey. Survey descriptive statistics were computed for (1) demographics, (2) preferred media channels for obtaining nutrition information, (3) trust in the accuracy of nutrition information obtained from the media, (4) campus media use, (5) interest in proposed campus media channel interventions, and (6) interest in select topics in nutrition, cooking, and physical activity. Pearson's Chi Square tests were used to identify possible relationships among demographics and media channel preferences.

RESULTS

Of the 169 students who completed the needs assessment survey, 119 (71%) students were freshmen or sophomores in college, and 114 (68%) were female. Less then half the students (42%) lived on campus.

The results from the needs assessment survey indicated that in general, television was the most desired medium for obtaining nutrition information with 129 (78%) students ranking television as a somewhat or more desirable medium (Table 1). Newspapers were the second most preferred channel with 121 (72%) students rating the print media format as somewhat or more desirable.

Table 1. Mass media preferences for nutrition information.[†]

Qualifier	n	More Desirable n (n%)	Somewhat Desirable n (n%)	Less Desirable n (n%)	Mean ± S.D.[‡] n (n%)
Watching television	166	47 (28.3%)	82 (49.4%)	37 (22.3%)	2.06 ± 0.71[a]
Reading newspaper articles	168	30 (17.9%)	91 (54.2%)	30 (17.9%)	1.90 ± 0.67[b]
Reading articles on internet	166	27 (16.3%)	66 (39.8%)	73 (44.0%)	1.72 ± 0.72[c]
Listening to the radio	168	15 (8.9%)	69 (41.1%)	84 (50.0%)	1.59 ± 0.65[c]
Watching internet videos	168	8 (4.8%)	49 (29.2%)	111 (66.1%)	1.39 ± 0.58[d]
Reading articles on email	168	10 (6.0%)	38 (22.6%)	120 (71.4%)	1.35 ± 0.59[d]

[†]Question: How do you prefer to receive information about nutrition through the media?
[‡]Based on a 3-point Likert scale (3 = more desirable)
[a-d]Different letter superscripts represent means that are statistically significant at $p<0.05$

Students trusted nutrition information obtained from newspaper above other mass media formats, with 38% of students reporting that they trust most or all information printed in this medium. The Internet was the least trusted channel, with only 16% of students reporting that they trust most or all information found on the Internet.

The college newspaper was the most utilized campus media channel with 68% of students reporting that they read the newspaper always (daily) or often (weekly), followed by the university website, campus television, and then radio. From the five proposed campus media interventions, students most preferred newspaper articles, with 87% of students answering that they were either somewhat or very interested in reading a weekly article on nutrition, cooking or exercise in the student newspaper (Table 2). In

addition, chi-square tests indicated that women were more interested in the newspaper intervention than men (p=0.013) and students living off campus were more interested in the newspaper intervention than those living on campus (p=0.009). Students were the least interested in listening to information on nutrition, exercise, and cooking techniques through the campus radio, with only 27% of students answering that they were either somewhat or very interested in this intervention (Table 2).

Table 2. Preferred Campus Media Intervention[1]

Media Channel	n	Very Interested n (n%)	Somewhat Interested n (n%)	Don't Think Would be Interested n (n%)	Absolutely Not Interested n (n%)
E-mail Article	169	42 (24.9%)	85 (50.3%)	29 (17.2%)	13 (7.7%)
Campus Television Program	169	15 (8.9%)	56 (33.1%)	74 (43.8%)	24 (14.2%)
Internet Videos	169	12 (7.1%)	68 (40.2%)	71 (42.0%)	18 (10.7%)
Campus Radio Program	169	4 (2.4%)	41 (24.3%)	98 (58.0%)	26 (15.4%)
Campus Newspaper Articles	169	70 (41.4%)	77 (45.6%)	18 (10.7%)	4 (2.4%)

[1]Sample Question: If a weekly article about nutrition, exercise and cooking was published in the Collegian Newspaper, would you be interested in reading it?

Of the 32 topics on nutrition, exercise, and cooking techniques, topics involving meal planning and cooking techniques were of highest interest. Six of the ten topics of highest interest involved meal planning, cooking, and/or shopping (Table 3). Students were also interested in receiving information on exercise tips, nutrition for immunity, eating more fruits and vegetables, and healthy fast food choices.

Table 3. Top 10 Topics of Interest for Media Interventions[†]

Rank (based on mean)	Topic	n	Mean[‡]	Very Interested n (n%)	Somewhat Interested n (n%)	Not Interested n (n%)
1	Easy cooking ideas	156	2.65±0.64	115 (73.7%)	27 (17.3%)	14 (9.0%)
2	Exercise tips	155	2.64±0.57	106 (68.4%)	42 (27.1%)	7 (4.5%)
3	Quick nutritious meals	157	2.63±0.64	113 (72.0%)	30 (19.1%)	14 (8.9%)
4	Nutrition for immunity	155	2.58±0.63	102 (65.8%)	41 (26.5%)	12 (7.7%)
5	Making recipes healthier	156	2.55±0.70	105 (67.3%)	32 (20.5%)	19 12.2%)
6	Cooking on a budget	156	2.50±0.72	99 (63.5%)	36 (23.1%)	21 (13.5%)
7	Grocery shopping tips	155	2.45±0.72	91 (58.7%)	43 (27.7%)	21 (13.5%)
8	Eating more fruits and veggies	157	2.41±0.68	82 (52.5%)	58 (36.9%)	17 (10.8%)
9	Meal planning	157	2.39±0.75	86 (54.8%)	46 (29.3%)	25 (15.9%)
10	Healthy fast food choices	156	2.38±0.76	85 (54.5%)	45 (28.8%)	26 (16.7%)

[†]Question: Which of the following topics interest you? Check the box that applies to your interest in each topic.
[‡] Based on a 3-point Likert scale (3 = very interested)

COMMENTS

Findings and Discussion

In this study, we examined college students' media use and preferences for obtaining information on diet and exercise. We found that 78% of respondents ranked television as a somewhat or more desirable medium for obtaining nutrition information. The media preferences of college students for obtaining nutrition information are similar to those of the general public (*Attitudes, Knowledge, Beliefs, Behaviors: Findings of American Dietetic Association's Public Opinion Survey Nutrition and You: Trends 2002*, 2002; O'Keefe & Boyd, 1998). The finding that college students preferred obtaining nutrition information via television over other sources confirms Novascone and Hertzler's results (Novascone & Hertzler, 1986). Watching television continues to be one of the most popular American past-times. On average, college students watch 24.3 hours of television a week (James, 2006).

When students were asked to rate their interest to a set of proposed campus-specific media interventions on nutrition, exercise, and cooking techniques, they were most interested in a series of newspaper articles printed in the campus newspaper. The overwhelming interest (87% of students were either very interested or somewhat interested) is most likely linked to the fact that the campus newspaper is the most utilized campus media channel and is more trusted then other media channels to deliver accurate nutrition information. In addition, campus newspapers are free of charge, and pick-up bins are conveniently located inside most buildings on campus at Colorado State

University. This finding suggests the potential of the campus newspaper as a desired health-promotion channel for college students.

Women and students living off campus were more interested in reading articles about nutrition, cooking techniques, and physical activity in the campus newspaper than men and those who lived on campus. Those living off campus may be more interested in reading articles in the campus newspaper on such health topics because they are responsible for shopping for and cooking their own food. Also, the campus newspaper may be a tool that students who live off campus use to stay in touch with recent happenings on campus. Social categories also play a role in the quality and quantity of attention given to a health message. For example, because of their traditional roles, women are much more likely to attend to a nutrition message than men (Gillespie, 1987; Gillespie & Yarbrough, 1984).

While television was reported as the most preferred media channel for obtaining nutrition information, watching a television series on nutrition, cooking, and exercise on the campus television station was of less interest than other proposed campus-specific media interventions. This result is likely related to the low viewership of campus television at Colorado State University. While students on campus have free access to the campus television station, this channel must compete with over 50 cable channels for regular viewers. Alternatively, the campus newspaper, which is paid for by student fees, competes only with one other local newspaper. Furthermore, campus newspapers are widely distributed on campus and readily available to students on weekdays. However,

the results of this study in its entirety suggest that we cannot ignore the use of television as a possible health education tool, as a stimulating, high reach medium favored by college students (Flora et al., 1997; Schooler et al., 1998).

We discovered that students are interested in learning more about cooking techniques, with 74% of respondents reporting that they were very interested in receiving information on easy cooking ideas. In general, respondents seemed most interested in topics surrounding meal planning, cooking, and shopping. Their interest in topics related to food preparation and planning may be related to the fact that the majority of subjects reported living off campus and are therefore responsible for preparing their meals. Furthermore, students often lack meal planning and cooking skills (Byrd-Bredbenner, 2004). Our findings are consistent with Cousineau and colleagues who also found that students are interested in gaining skills in healthy meal planning and eating on a budget (Cousineau, Goldstein, & Franko, 2004).

Mass media channels often provide only one-way communication, thus limiting the acceptance of a message (Gillespie, 1987; Gillespie & Yarbrough, 1984). In addition, due to the differences in involving and arousing components of each media channel, it is uncertain which channels influence learning the most. While mass media health education cannot replace personal interaction with a health educator, it does have the potential to reach large segments of the population (Schooler et al., 1998) and influence social norms (Flora et al., 1989). Wechsler proposed that using campus media channels to disseminate health information may lead to a change in social norms (Wechsler et al.,

1992). Social norm plays a role in the attitudes and opinions of the audience (Azjen & Fishbein, 1980). Thus college students are more likely to change their dietary behaviors if they think recommended changes would be acceptable to their peers. The influence each campus media channel plays on social norms must be explored further in future studies.

Limitations

There are some limitations to this study. The study population was a convenience sample of college students. While an introductory core curriculum college anthropology class provided student subjects from a variety of majors, the study participants were fairly homogenous in terms of grade level. The majority of subjects were freshmen or sophomores (71%); therefore the results of this study can not be extrapolated to all undergraduate students. Freshmen and sophomore students may be less familiar with campus media resources then upperclassmen, further limiting our ability to generalize these results to all students on campus. However, the survey was conducted in the Spring semester, so most subjects would have been on campus for at least half of a school year, allowing them to become somewhat familiar with campus media channels.

This survey was conducted at a large state school and therefore, the findings may not be generalizable to other college populations. In addition, respondents also self-reported their media use to obtain health information and such information may not be directly comparable to non-self-reported results found in other studies. The way in which other researchers worded questions regarding media preferences may have lead to different results.

Implications for Colleges and Universities

This was the first study that we are aware of that explores campus media channels as a method to deliver information on nutrition and physical activity to students. Additional research is warranted on other university campuses to determine the preferred campus media channels for receiving this information. Each college campus is unique with respect to their campus media resources. Colorado State University is a large university and has a thriving journalism department. Therefore, several forms of mass media are available to students.

Student-run media organizations often follow strict policies that may or may not be conducive to the introduction of new ideas. At the college newspaper at Colorado State University, editors do not allow non-staff members to write for the paper. On occasion, newspaper staff employees write articles on health issues. In that case, the authors must rely on experts to provide them with factual information. While nutrition and exercise professionals on college campuses may be unable to write for a college newspaper, they can and should make themselves available to the newspaper staff. Health educators on college campuses should offer their contact information to college newspaper staff and encourage them to write accurate articles on health topics pertinent to students on a regular basis. A student columnist could be paired with a health expert to produce a regular column on health topics.

Mass media channels can be an effective way to disperse information to a large group of people at a realistic cost. The cost of campus media channels is often much lower than the cost of utilizing community-based media channels. Assessing student use and acceptance of these channels on a college campus is an important first step before implementing a campus media intervention. Future research efforts should be designed to measure the impact and long term benefit to the health and wellbeing of this important population.

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CHAPTER 3: The Development of a Cooking Program to Deliver Nutrition Information to College Students

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Abstract

Viewing cooking programs on television have recently become a popular American pastime. Few of these programs provide nutrition advice or demonstrate how to prepare quick and healthful meals that appeal to young adult audiences. In an effort to develop a nutrition education program geared towards college students, focus groups were conducted to assess the appeal of a pilot cooking program. Findings suggest that students relate best to peers viewed in their natural environment with minimal scripted scenes. They prefer health messages in which someone is not talking at them, but rather demonstrating the skills necessary to incorporate nutritious foods into their meals and snacks. The cooking scenes were well-received by student audiences and included recipes that they felt were simple, and realistic. Results from these focus groups support the recent trend in the popularity of cooking programs and reality television for young adult audiences.

Introduction

From Emeril to Wolfgang Puck, and everywhere in between, cooking programs have gained popularity in the last decade. Today, television viewers can watch their favorite cooking experts whip up masterful creations while sitting in the comfort of their living rooms. Cooking program themes run the gamut from healthful cuisine to culture-specific foods and gourmet dining. While this wide spectrum of show themes may appeal to a large audience, few of the programs offer easy, low cost cooking ideas targeted at the college population.

The college-aged population has unique barriers to adapting healthful eating habits. As they move away from home and begin independent living, they often lack the knowledge, skills, and self-efficacy needed for basic meal planning skills (Betts et al., 1997; Koszewski & Kuo, 1996; McArthur et al., 2000). Therefore, the diets of college students are low in fruits and vegetables (Hertzler et al., 1995) and high in dietary fat (Hertzler et al., 1995; Hoffman, 1989; Horwath, 1991; Y. Huang et al., 1994), cholesterol (Hoffman, 1989) and sodium. College students have limited free-time (Betts et al., 1995; Koszewski & Kuo, 1996), consequently reaching this audience with health interventions, while necessary, can be a challenge.

Communication through the mass media can be an important component of health strategies designed to change health risk behaviors (Flora et al., 1997). With broadcast, cable, and satellite services reaching a massive audience, television has the potential to disseminate health messages to a large and diverse population (Flora et al., 1997). Watching television continues to be one of the most popular American past-times; during the 2004/2005 school year, college students living away from home watched an average of 24.3 hours of television per week (James, 2006). Previous research conducted at Colorado State University suggests that students prefer to obtain nutrition information through watching television over other forms of mass media (Clifford et al., 2006b). The television may be an appropriate vehicle for providing college students with the information they need about nutrition and cooking.

Several researchers have coordinated the development of televised nutrition education programs for specific target audiences (Chew et al., 1995; Chew et al., 1998; Duyff, Marcantel, Ray, & Register, 1982; Jenkins, 1975; Puska & McAlister, 1981;

Shannon et al., 1979; Smith & George, 2001) (Table 1). Most have attempted to assess the effect these programs have on knowledge, attitudes and behaviors of study participants. In general these programs seem to increase public awareness and result in increased nutrition knowledge. Although several studies have investigated the influence nutrition oriented television programs may have on children (Jenkins, 1975) and adults (Chew et al., 1995; Chew et al., 1998; Puska & McAlister, 1981; Shannon et al., 1979; Smith & George, 2001), none has focused on young adults, who are especially unequipped for planning and preparing meals (Byrd-Bredbenner, 2004). Furthermore, none of these programs offered nutrition information in a cooking program format.

The Western world has witnessed a boom in food television in the early twenty-first century (de Solier, 2005). Several countries now have entire channels devoted to food programming. In addition to an exponential increase in the number of food programs shown on television, there has been an expansion in the variety of such shows that reflect contemporary programming formats (de Solier, 2005). Often, the viewing public turns to cooking programs for more than just entertainment, but also for information on cooking. Caraher and colleagues surveyed the British public in 1993 and found that 1,079 (19.4%) of the 5,553 respondents cited televised cooking programs as useful sources in learning more about cooking (Caraher, Lange, & Dixon, 2000). The same survey also asked where people would go to find out more about cooking techniques. Television was cited by 30% of respondents.

With the continued increase in the popularity of cooking programs, this avenue may become a viable option for providing viewers with nutrition information. Of the 56 programs on the Food Network lineup, at least seven are geared towards healthy cooking

methods and often providing viewers with specific information on nutrition (*Food Network Show List A-Z*).

Social Learning Theory

For television viewers to adopt the dietary changes recommended on these programs, they must value the information, learn how to overcome obstacles shaped by their environment and gain self-efficacy in their skills and abilities (Bandura, 1977). Albert Bandurra, the founding father of the Social Learning Theory, suggests that the environment as well as the thoughts and events that shape a persons life affects their dietary behaviors. And conversely, behaviors influence the environment and personal factors (Bandura, 1977). Interventions that are driven by the Social Learning Theory address personal factors and environmental barriers that prevent individuals from practicing healthful behaviors. Members of the target audience are provided with behavioral skills and informed of the expected outcomes of a particular behavior. According to Bandurra, it is important that individuals have a high sense of self-efficacy in their ability to perform a particular behavior and that they value the expected outcomes. This is often accomplished through modeling the actions of those performing the particular health behavior and through providing reinforcements in the form of rewards or supplementary educational materials.

Television, when used to educate audiences on health, can act as a symbolic environment as images viewed on television can impact behavior patterns and thought processes (Bandura, 2002; Terre, Drabman, & Speer, 1991). In the context of the Social Learning Theory, Bandura states, "Whereas previously, modeling influences were largely

confined to the behavior patterns exhibited in one's immediate environment, the accelerated growth of video delivery technologies has vastly expanded the range of models to which members of society are exposed day in and day out"(Bandura, 2002). Televised modeling is now being used to effect social change at community and society wide levels. During observational learning, it is important that viewers see people similar to themselves changing their lives for the better. These images not only convey strategies for how to do a specific behavior, but also raise television viewers' sense of efficacy that they too can succeed.

Focus Groups

Before an intervention is implemented, it is important to determine the impact of the proposed intervention on the target audience (Windsor, Clark, Boyd, & Goodman, 2004). Formative evaluation can provide insight during the early developmental phase of an intervention and are often used to revise intervention components. Evaluation methods can include qualitative data in the form of observations, written reports, interviews, and focus groups (Windsor et al., 2004).

In the field of health communication, focus groups are a common method to evaluate the acceptance of a proposed media format and to assess health education messages (Basch, 1987). The mid-1980's produced a surge of interest in focus groups (Morgan, 1996). Specifically, there has been a re-emergence of the focus group in the context of media research (Lunt & Livingstone, 1996).

Recently, health educators have followed suit and are conducting focus groups to guide the development of their mass media interventions (Cousineau et al., 2004; Ruud JS, 2005). Before focus groups were used in health education, they were used within communication studies to explore the effects of films and television programs (Merton, Fisk, & Kendall, 1956). Today, health educators are utilizing these same focus group methods to determine audience acceptance to health-based televised programs. In 1995, Elkamel used focus groups to understand audience feedback to a health education show that was aired in Egypt (Elkamel, 1995). The Family House was a 15-episode series that included a variety of health messages in a soap opera series that reflected Egyptian culture. Through focus groups, researchers were able to determine viewers' interest in health messages as well as their reaction to the main entertainment elements.

Researchers argue that the advantage of focus groups is the direct outcome of the interaction in focus groups, which has been termed "the group effect" (Carey, 1994; Carey & Smith, 1994). The discussion in focus groups is more than the sum of separate individual interviews. Participants both query each other and explain themselves to each other. This interaction offers valuable data on the extent of consensus and diversity among the participants. Focus groups provide insight into the trends and patterns of culture. In the case of television, focus groups can simulate discussion that may occur following everyday domestic viewing (Lunt & Livingstone, 1996).

In this study we developed a pilot television program, grounded in the Social Learning Theory, which provides young adults with accurate nutrition information while educating them in basic cooking skills. The objective of our research was to assess viewers' potential interest in the health messages integrated into the pilot television

program and to pre-test focus group members' reaction to the main entertainment elements such as program format, pace, characters, etc, in order to give immediate guidance for program production.

Methods

Program Development

In the spring of 2004, the pilot program, *Good Grubbin'* was produced to educate university students on nutrition and cooking. The themes for the program were based on results of a needs assessment survey conducted with 169 students from a variety of academic interests (Clifford et al., 2006b). The topics of primary interest included the benefits of fruits and vegetables along with ideas for incorporating them into meals and snacks as well as strategies for creating quick nutritious meals.

The pilot program was constructed in such as way that focus group audiences would be exposed to several different elements in varying formats. Scenes varied in their level of scripting, characters involved, and location. Scripts for the program were written by the primary investigator. Three student actors were selected through a series of auditions. Male and female hosts were chosen in an effort to attract viewers of both genders. A student chef was selected and the role of the nutrition expert was played by a Registered Dietitian. Actors were chosen based on their acting abilities and their similarities to the target audience.

Television show production was led by staffers of the campus television station. Campus television is a student-run organization that provides a learning environment for students pursuing careers in television production under the advisement of the Board of

Student Communications at Colorado State University. A great deal of time was spent in the planning and execution of this program to ensure that the production quality matched those of professional local television. The campus television staff has experience in videography, lighting, editing, music, and graphics.

The pilot program of *Good Grubbin'* included the following segments:

1. **Introduction.** The male and female hosts introduced the show with a short dialogue explaining the format of the show.
2. **Student interviews.** A series of candid interviews were conducted with students of Colorado State University by the male student host about their intake of fruits and vegetables as well as their barriers to eating the recommended servings. These scenes were filmed on campus in the student center quad where students commonly congregate during the school day.
3. **Grocery Store Scene.** The grocery store scene was filmed in a store near campus. In this scene, a Registered Dietitian explained to the male college student host the benefits of fruits and vegetables as well as strategies to include more fruits and vegetables in his diet. At the end of this scene, the dietitian challenged the male host to eat 2 cups of fruit and 2 ½ cups of vegetables that day, which is the recommended amount based on the dietary guidelines for a 2,000 calorie eating plan. The dietitian then followed the male host around campus to determine if he was successful.
4. **Cooking Scene.** The cooking scene was filmed in a studio kitchen at a local food distribution center. In this scene the student chef demonstrated to the female

hostess how to add vegetables into a spaghetti dish as well as other quick and easy meal and snack ideas that included fruits and vegetables.

5. **Additional Features.** Facts about fruits and vegetables were inserted as commercial bumpers, or brief transitions placed between a pause in the program and commercial breaks. A fictitious website address was also introduced at the end of the program as a place where students could find the nutrition tips and recipes discussed on the show.

Focus Group Participants

Students were recruited from a core curriculum health and wellness course at Colorado State University to participate in focus groups. Subjects were assigned to four female and four male focus groups. Those who participated were awarded five points extra credit in their health and wellness course and were provided a free meal. The study was approved by the Colorado State University Human Research Committee and written informed consent was obtained from all participants.

Focus groups followed established procedures (Krueger & Casey, 2000). During the focus groups, the moderator initiated discussion with introductions and questions regarding general interest in cooking shows. This short discussion was followed by a viewing of the pilot television program, *Good Grubbin'*. Following the pilot episode, participants were asked questions regarding their likes, dislikes and ideas for future episodes (see Appendix).

The moderator guide and question series were reviewed by an expert panel for content validity and general flow. The expert panel consisted of two professors and six

graduate students from the Department of Food Science and Human Nutrition and one professor from the Department of Journalism and Technical Communication. Focus groups were audio recorded and then transcribed. Content of each transcript was verified for accuracy against audio tapes. All focus groups were conducted by a trained focus group moderator, with a co-moderator noting key points.

Coding Procedures

The focus group session was transcribed verbatim. Transcripts were coded by the primary investigator as well as a second trained expert in order to validate original findings (Krueger & Casey, 2000). This systematic process was guided by a grounded theory approach validated by others (Lincoln & Guba, 1985). Selective coding was conducted to develop core categories (Krueger & Casey, 2000). These responses were then summarized for each focus group and then compiled to determine agreement among and between groups.

Results

Of the eight focus groups that were originally conducted, data were analyzed from four female and three male focus groups. Data could not be used in one male group due to mechanical errors in audiotaping. Between 7 and 10 students were present in each focus group, for a total of 57 participants.

Program Segments

Student Interviews. In the beginning of the pilot program, several students were interviewed in a candid fashion by the male student host on their intake of fruits and vegetables as well as their barriers to eating the recommended servings. In general, focus group members reported liking how the program was geared towards students at their own university and enjoyed seeing their peers on camera in this scene. One participant noted:

> "I liked the CSU part, when you make it applicable showing kids on campus and stuff, like that's good, but it needs to be throughout." (male)

Another participant added, "...I really liked in the beginning how it went around the campus and talked to the students...have more people, just ordinary people around the campus involved in the show. Maybe more interviews, or just have some more people like that." (female)

Female focus groups mentioned identifying with the struggles of students interviewed in this scene more so then the male focus groups. One female student shares, "...and if I were the producer I would be like the audience can really relate to that. They can see their friends on TV and they might be on TV and that's what really gets people to watch it."

Grocery Store Scene. During the grocery store scene, a Registered Dietitian explained to the male college student host the benefits of fruits and vegetables as well as strategies to include more fruits and vegetables in his diet. Students shared that while the

grocery store scene offered some useful information about nutrition, in general, the information was too basic and the scene itself was too long. A participant explains:

> "Some of the stuff that like [the dietitian] said in the grocery store she was saying like phyto...something, like that's too much like the health class that we're already in. Oh, I heard that today, I don't need that." (male)

A participant in a different focus group also found the information presented to be dull:

> "The first part was kind of boring, and we kind of know it already, I mean it was basic. It was helpful, but a little long." (female)

Cooking Segment. The cooking scene followed a cooking show format with a male student chef explaining to a female student host how to incorporate fruits and vegetables into meals and snacks. Students found the cooking segment to be useful and entertaining. They liked the majority of the recipes that were demonstrated and felt that they were foods that they would actually cook. One student related:

> "A lot of it, like at the beginning [in the grocery store segment], they were speaking like at us more telling us this is what you need to do, and then towards the end when they were doing the cooking, I think a lot more of that...because it's easy to see yourself doing something that simple and easy in order to incorporate the amount of fruits and vegetables you need in a day." (female)

Another student agreed that the cooking segment was appropriate for busy college students:

> "I liked the different ideas of incorporating fruits, just for our busy schedules and just the different ideas to incorporate them into our meals." (male)

The simplicity of the meals demonstrated on the program were summarized by one female participant who stated, "I liked how they showed meals that seemed really simple to make and that didn't seem to take that much time to do or something."

In addition, there was general agreement among all of the male focus groups and half of the female focus groups that more information was needed on cost of ingredients, since most college students are on a tight budget. One student explained:

> "I could have gone for more financial stuff. Because whenever I'm in the produce section it just seems like it makes my grocery bill more, and that's one of the reasons I stay away from it. So, they had all these good ways to eat, they said which ones are cheaper, but I'd like to know how much that adds up to." (male)

Program Formatting

Students suggested that future episodes be more cohesive, with a stronger link between the grocery store segment and the cooking segment. One student shares:

> "Maybe like go shopping for the stuff that's needed for the cooking stuff to like show them. Instead of just being at the grocery store and buying like random fruits and vegetables, show the stuff that they're using." (female)

In addition, they advised that the grocery store segment be shortened while including the bulk of the nutrition advice during the cooking segment. One student relates:

> "I think if they incorporated everything they used in the supermarket scene, just in that cooking...I mean obviously you want re-iteration of fruits and vegetables, but I think as they're going along that's something that probably could have been talked about while they're cooking." (male)

Another student in a different focus group was in agreement when he stated, "If that stuff [nutrition information] was incorporated into like as their cooking it, like being more like a cooking show, as they're preparing the food talk about nutritional stuff about it." (male)

Each of the three male focus groups suggested shortening the 30-minute program altogether, while none of the female groups made this suggestion. One male focus group member shared his opinion with the group:

> "Instead of its own show, make it more of a commercial thing. You could have it like 10 minutes before the hour and I'm sure you could cut it down to 10 minutes and make it show the recipes, show the cool new ideas for snacks or whatever."

Character Feedback

Students felt that the characters had personality, but they were not well defined and they acted fake. One focus group participant stated:

> "They [the hosts of the show] tried to act fake and ask stupid questions, but I thought it was interesting." (male)

Another student contrasts the show characters to those viewed in a documentary when he states, "Just the whole fakeness, like the acting and all that, asking stupid questions and being really redundant, got too redundant. If you're pertaining to college students...I don't know if you saw "Super-Size Me", but it just had facts, like really interesting...." (male)

Ideas for Future Episodes

Students were asked to suggest topics they would like to see on future episodes of *Good Grubbin'*. There was great variability in students' topics of interest. Topics that

were mentioned by most groups included ethnic themes, recipe ideas for breakfast and lunches, and foods you can take with you.

During the program, the concept of a website was introduced. Viewers were informed they could access the website in order to obtain recipes and nutrition tips discussed on the show. Students were asked if they were likely to visit this website and what type of information they would hope to obtain on the website. It was not clear how interested focus group participants were in the concept of the website. When asked what they would like to see on a supplementary website, they were most interested in obtaining the recipes seen on the show as well as information on nutrition and the nutrient content of recipes. One student shares:

> "I might [visit the website] after seeing stuff that they had...different ideas for meals and whatever." (male)

When the moderator probed the participant to share items she'd like to see on the website, she adds, "Tips for healthier cooking, little tidbits and stuff like that." Another participant inserts: "...recipes and the calories in it, and maybe how much it costs to make." (female)

Discussion

Focus groups were an appropriate method for determining audience reaction to the pilot program of *Good Grubbin'*. Through conducting focus groups with the target audience, we determined their preferences for health messages, program format, flow and character development. Students were able to discuss these issues openly immediately

following the program, emulating a conversation that may naturally occur with peers after watching a new show.

This health-based television program was intended to encourage behavior change. The script development was guided by constructs of the Social Learning Theory, with special emphasis in observational learning. Therefore, it is crucial the target audience accepts and relates to the students they see in the program. From our research it is evident that college students relate best to students viewed in their natural environment with minimal scripted scenes. They prefer health messages in which someone is not talking at them, but rather demonstrating the skills necessary to incorporate nutritious foods into their meals and snacks.

It is evident that students prefer television formats that resemble reality television. They preferred the scenes that were less scripted and incorporated real students. They were turned off by actors who seemed fake. A finding similar to that was reported by Alice Hall who also found during focus group discussions that young adults prefer reality television (Hall, 2006). Reality programming has been one of the biggest phenomena of recent television seasons. During the summer of 2003, the four major broadcast networks planned no fewer than 25 reality programs, and almost every major cable network seemed to be experimenting with at least one (Carter & Rutenberg, 2003).

The linking together of reality television and health advice was first attempted by Puska and colleagues back in the 1980's in Finland. Their program followed eight Finnish citizens at high risk for cardiovascular disease who were asked to make behavior changes in front of the camera. Through a series of mailed surveys and telephone interviews, they found this approach to be successful with 42% of female viewers and

32% of male viewers reporting that they followed the program. In addition, over 1% of men and 2% of women reported losing weight with the aid of the program. This reality health television concept was recently emulated by the National Broadcasting Network (NBC) with their new television program, "The Biggest Loser" (Ives, 2006). Other networks have recently followed suit including The Learning Channel's "Honey We're Killing the Kids," and the Food Network's, "Weighing In."

Our qualitative data suggests students are interested in receiving nutrition and cooking information in a cooking program format rather than an educational program format. This information is consistent with focus group research in Great Britain by Caraher and colleagues in which participants stated that they did not want to be taught or 'force fed' health education messages, but instead wanted health advice and tips in short bursts that were in the context of the cooking program (Caraher et al., 2000).

Furthermore, students voiced their preferences for obtaining cooking advice that involves quick and easy methods using inexpensive ingredients. This feedback is supported by our previous research in which surveyed students reported a high level of interest in meal planning, easy cooking, and shopping on a budget (Clifford, 2004). This is further supported by Byrd-Bredbenner who found that young adults view preparing foods from "scratch" negatively (Byrd-Bredbenner, 2004). Focus group participants in this study also related interest in learning how to prepare breakfast and lunches as well as foods that can be carried along.

Student participants responded somewhat positively to a supplemental website that would provide recipes and nutrition information. The Internet is a popular resource for today's college student (Jones, 2002). In our previous research, over half of students

conveyed that reading articles on the internet was a desirable medium for obtaining nutrition information (Clifford, 2004). Most cooking shows today have supplemental websites that provide viewers with recipes, health information, as well as information on their chefs and upcoming episodes. With the rapidly growing use of high speed Internet, websites can feature archived and original programming that students can interact with at any time. Through providing a supplemental website for *Good Grubbin'*, viewers would be able to easily access the nutrition tips and recipes they see on the program, and therefore may be more likely to utilize the information. Furthermore, this would allow for multiple exposures to the primary health messages, increasing the likelihood of message acceptance by the target audience (Gillespie, 1987).

Based on the focus group data, it was determined that future episodes of *Good Grubbin'* would be shortened to 15 minutes in length. In an attempt to emulate reality television, students with real meal planning and nutritional struggles would replace student actors. These students would share their struggles at the beginning of the program and then meet with a nutrition expert and chef to gain tips for improving their own diet. Together, the student and the food expert would briefly visit the grocery store to purchase ingredients that would be used in the cooking scene.

As suggested by focus group participants, the majority of information on nutrition would be weaved throughout the cooking segment. The end of the program would include a short scene in which the featured student would share the impact being on *Good Grubbin'* had on their diet, demonstrating that they were successful at overcoming their nutritional barriers. It was concluded that watching real students instead of student actors

overcome barriers to following a healthful diet would send a powerful message to student viewers struggling with similar issues.

Limitations

Focus group participants were recruited from a lower division health class and therefore, their viewpoints may not be representative of the entire student body. However, the class was a core curriculum course, and therefore included students from a variety of academic interests.

Conclusions

This research supports continued exploration of the use of television to reach young adult audiences with information on nutrition and cooking. Their high interest in television as a preferred media choice for obtaining nutrition information as well as their positive feedback to a pilot television program suggests that this format may be appropriate for reaching student audiences.

Future research efforts of televised nutrition and cooking programs should consider differences in audience preferences of various ethnic and socio economic groups. Once optimal program formats are determined, additional research is needed to determine the impact of health-based cooking programs on the dietary knowledge, attitudes, and behaviors of college students.

Alternative methods of delivering televised programs should also be explored. With increases in high speed Internet use, interactive videos offer an alternative method for delivering televised programming. Future research should investigate if differences in

the delivery of health education programs impact audience acceptance and response to program messages.

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Table 1
Televised Nutrition Education Programs

Author/Authors, Date	Program Title	Target Audience	Number, length of Episodes	Program Format
Jenkins, 1975	Mulligan Stew	4th grade students	6, 30-min.	Educational programming mimicking shows such as "Sesame Street" and "The Electric Company" with supplementary classroom and workbook activities
Shannon et al, 1979	Foodene	Adults	1, 60-min.	Dramatic vignettes combined with a lecture format that included visual aids in the form of still photographs, film, graphs and models
Puska and McAlister, 1981	Keys to Health	Adults	10, 30-min.	Reality television format with 8 Finnish citizens attempting to modify their health-related habits by following instructions from experts
Duyff et al, 1982	Soup-to-Nuts	Middle/ junior high school students	10, 15-min.	Educational programming aimed at influencing cognitive, affective, and behavioral processes, with supplementary classroom activities
Chew et al, 1995	Eat Smart	Adults	1, 60-min.	A presentation of scientific data on fat consumption along with practical steps for consumers
Smith and George, 2001	NA	Pregnant and lactating women in Alaska	15, 30-min.	Interviews of mothers and health professionals, food demonstrations, and cultural facts

Table 2
Focus Group Summary

Theme	Males			Females			
	1	2	3	1	2	3	4
Student Interviews							
Liked interviewing students about their diets	X	---	X	X	O	R	O
Could relate to the dietary struggles of students	---	---	---	---	X	O	---
Grocery Store Scene							
Information was too basic	X	X	O	R	X	---	R
Segment was too long	X	X	X	X	X	X	R
Grocery store scene was helpful	---	---	---	---	O	O	---
Cooking Scene							
Overall, cooking information was useful	X	X	X	X	X	X	X
Recipes were affordable and realistic	X	X	R	X	X	R	R
Would like more information on cost of ingredients	X	R	X	X	O	---	---
Program Format							
Include nutr. information while cooking	R	R	X	X	X	O	X
Chef should buy groceries for cooking segment to improve the flow	---	O	---	---	O	O	---
Shorten show length	O	X	R	---	---	---	---
Character Feedback							
Characters need to be better defined	O	---	O	---	---	O	---
Characters acted fake	R	O	O	R	O	O	O
Ideas for Future Episodes							
Ethnic Themes	O	O	---	O	R	---	O
Meals other than dinner	---	O	O	O	---	R	---
Foods you can take with you (snacks)	---	O	O	O	O	O	X
Website							
Nutrition information/facts	NA	O	O	O	R	R	O
Recipes	NA	---	O	R	R	X	R
Cost facts	NA	---	O	---	R	---	---

X= Strong agreement
R= Some agreement
O= No agreement
NA= Not asked in focus group
--- = Did not mention

APPENDIX

Focus Group Moderator Guide

1. I'd like to begin by asking you to tell us your name and tell us your favorite television show and what you like about it. _____.
2. What do you think about Campus Television? What shows have you watched on Campus Television?
3. What do you think about educational shows such as those you might find on PBS, the Discovery Channel or the Food Network?
4. What do you think about cooking shows?
    a. To those who say they watch cooking shows- what type of cooking shows do you like?

Play 30-minute pilot episode

5. The show you just saw is a cooking show aimed at college students. It will be aired in the spring of 2006. How likely are you to watch a show like this?
    a. If you are likely to watch shows like this, what do you expect to get out of watching these types of shows?
    b. If you are not likely to watch shows like this, what would get you to watch more shows like this?
6. What did you like best about the show you just saw?
    a. What was most interesting (or new) to you?
7. What did you like least about the show?
    a. What was least interesting (or new) to you?
    b. If you were the producer, what changes would you make for future episodes?
8. The tentative title of the show is Good Grubbin'. What do you think of the title?
9. What did you think about the characters on the show?
    a. In what ways did you find that you could relate to the people on the show?
    b. For those of you who don't relate to the people on the show, how do you think that you were different than the people on the show?
10. What topics do you think should be covered on future shows?
11. How likely are you to visit the website to view tips and recipes? What information would you like to see on the website?
12. What other advice do you have to help us make the program better? Is there anything that we missed? Of all the things that we've discussed, what do you feel is the most important for the success of the show?

CHAPTER 4: Good Grubbin: The Impact of a Cooking Show on the Diets of College Students

Manuscript to be submitted as a Research Brief to the Journal of Nutrition Education and Behavior

INTRODUCTION

Leaving home to attend college is a momentous occasion in students' lives as they begin to make independent decisions concerning their dietary patterns. As they move away from home and begin independent living, they often lack the knowledge, skills, and self-efficacy needed for basic meal planning skills (Betts et al., 1997; Koszewski & Kuo, 1996; McArthur et al., 2000). Therefore, the diets of college students are low in fruits and vegetables (Hertzler et al., 1995) and high in dietary fat (Hertzler et al., 1995; Hoffman, 1989; Horwath, 1991; Y. Huang et al., 1994), cholesterol (Hoffman, 1989), and sodium.

A national health objective from *Healthy Campus 2010 (Novascone & Hertzler, 1986)* focuses on the need for nutrition education in colleges and universities. Specifically, the objective is to increase the proportion of college and university students who receive information from their institutions on this topic.

Media channels on college campuses may be one such way to deliver health information to students. Previous research suggests that college students prefer to obtain nutrition information from the media (Novascone & Hertzler, 1986). Research conducted at Colorado State University (CSU) indicated that students prefer to obtain nutrition information through television above other media channels (Clifford et al., 2006b). Television is a high-reaching mass media channel and has the potential to disseminate health messages to large and diverse audiences (Flora et al., 1997). Watching television continues to be one of the most popular American past-times. On average, college students watch ten hours of television a week (Betts et al., 1995). Therefore, the television may be an appropriate vehicle for providing college students with the information they need about nutrition and cooking.

Several researchers have coordinated the development of televised nutrition education programs (Chew et al., 1995; Chew et al., 1998; Jenkins, 1975; Puska & McAlister, 1981; Shannon et al., 1979; Smith & George, 2001). They have attempted to assess the effect these programs have on knowledge, attitudes and behaviors of study participants. In general these programs seem to increase public awareness and result in increased nutrition knowledge. While several studies have investigated the influence nutrition oriented television programs may have on adults (Chew et al., 1995; Chew et al., 1998; Puska & McAlister, 1981; Shannon et al., 1979; Smith & George, 2001), none have narrowed their focus towards young adults, who are especially unequipped for planning and preparing meals (Byrd-Bredbenner, 2004).

Today's college students are less likely to learn the skills to cook—skills they once learned from their parents and schools. Often, the viewing public turns to cooking shows for information on cooking (Caraher et al., 2000). The 21st Century has witnessed a significant increase in the number of cooking programs shown on television (de Solier, 2005). No previous efforts have been made at developing and evaluating a cooking show as a format for delivering nutrition information.

The objective of this research was to develop a nutrition-oriented theory-driven cooking show designed for college students living off campus and to determine if a series of four 15-minute episodes influenced knowledge, attitudes, and behaviors regarding fruits and vegetables.

DESCRIPTION OF INTERVENTION

The study, conducted in the fall of 2005 and spring of 2006, involved college upperclassmen at CSU. Students were recruited from upper-division journalism and

agricultural economics courses. Self-selected subjects were randomly assigned to intervention or control groups. Subjects in the intervention group viewed four 15-minute cooking programs over a four week period. Subjects in the control group viewed four five-minute programs on sleep disorders. All subjects viewed these assigned programs on the internet and were assessed at pre, post and follow-up using two different survey tools. In addition, to ensure that these programs were viewed, students were asked to complete a short five-question survey after each episode. Approval for this project was obtained from the university's human research committee.

Program Format

Subjects in the intervention group viewed *Good Grubbin',* a four-episode series on cooking and nutrition. The program series was developed in the summer of 2005 in collaboration with the campus television station filming crew. The format of the program was derived from feedback provided by students who viewed a pilot program and participated in focus groups in the spring of 2005 (Clifford, Anderson, & Auld, 2006a).

On each show, a student guest was invited to share their struggles with a particular meal planning or nutritional issue. This brief interview allowed the student guest to explain to the audience their specific meal planning challenge. In addition, their friends were interviewed to elaborate on their perception of their friend's issue. Next, a Registered Dietitian took the student to the grocery store where she explained why they were buying certain products and the dishes she was going to demonstrate. The majority of the 15-minute program took place in the kitchen where the dietitian cooked with the student and demonstrated strategies to overcoming the student's barriers. The final scene

consisted of an interview with the student guest who explained how they were able to overcome their dietary barriers through strategies learned on the show.

While incorporating fruits and vegetables into meals and snacks served as the overriding theme of the program series, each episode covered a different subtopic that was based on the student's barriers to planning and eating healthy meals and snacks. The four episode-specific subtopics were weight loss, cooking vegetarian, grilling for a group of friends, and storing fruits and vegetables.

The Social Learning Theory

Program development was driven by the Social Learning Theory (Bandura, 1977). The physical environmental component of reciprocal determinism was addressed through filming in two locations that students frequent, the grocery store and the kitchen. Viewers were shown how to prepare, shop for, and plan healthful meals. Expectations, or the anticipatory outcomes of a behavior, were addressed as behavior changes made by students on the show demonstrated potential barriers and positive outcomes viewers can expect when making the recommended dietary changes. Expectancies, or the values that the person places on a given outcome, were demonstrated as students on the show demonstrated at the beginning of each episode, the value they place on making healthful dietary choices. Self-efficacy was addressed as the dietitian demonstrated quick, simple recipes and the student guest was viewed assisting in these uncomplicated cooking tasks. Observational learning was incorporated through the use of real students in each episode modeling the behaviors of the dietitian. Vicarious motivators were addressed at the end of each episode as the positive outcomes of behavior changes made by the student guest

were emphasized in the final student interview. Reinforcements were provided through the campus website where nutrition tips and recipes discussed on the show were made available for subjects in the intervention group.

Surveys

Participants completed two surveys at baseline, postintervention and 4-month follow-up: a food frequency questionnaire (FFQ) and a personal factors survey. In addition, participants in the intervention group completed a program feedback survey postintervention to determine their interest, likes, and dislikes of *Good Grubbin'*. Finally, all subjects completed brief five-question surveys after viewing each weekly episode in order to verify that they were adhering to study protocol.

The FFQ was adapted from the National Cancer Institute (NCI) Health Habits and History Questionnaire by Ma and colleagues to include foods eaten by young adults (Ma et al., 2002). The survey included 12 fruit items and 14 vegetable items. Frequency of consumption was measured on an eight-level rating scale from never to twice per day or more. Between three and six options of serving sizes were provided.

The personal factors survey included questions on demographics as well as knowledge, attitudes, and behaviors related to fruits, vegetables and cooking. Specifically, demographic questions focused on age, year in school, and living arrangements. Ethnicity was not assessed because the student population at CSU is not diverse. Knowledge questions addressed the 2005 Dietary Guideline recommendations for fruits and vegetables. Attitude questions pertained to motivations and barriers to cooking and eating fruits and vegetables as well as self-efficacy of cooking and

consuming fruits and vegetables. Behavior questions focused on the frequency of students' cooking, eating out, and meal skipping patterns.

The program feedback survey, which was given only to the intervention group, included questions to determine their overall enjoyment of and interest in the show series as well as their interest in visiting the supplementary website and attempting recipes viewed on the program. They were asked if they could relate to the characters on the show and the challenges they faced. In addition, participants were asked if they made any changes in their eating habits as a result of watching *Good Grubbin'*. If they answered yes, they were asked to complete an open-ended question specifying the changes they made.

An expert panel of researchers in nutrition and media established the content validity of the personal factors survey and program feedback survey. The panel consisted of three nutrition professors, a chef, and a technical journalism professor. Both the personal factors survey (n=35) and the FFQ (n=45) were tested for reliability using the test-retest method 14 days apart in a first-aid/CPR course. All questions were assessed for reliability using Pearson's correlations, percentage agreement, and paired *t* tests. FFQ reliability was confirmed with totals for fruits and vegetables with correlations and/or percent agreements between test and retest equal to or above 0.60 or 60%, respectively. All demographic and knowledge questions had correlations and/or percent agreements above 0.70 or 70%, respectively. All attitude questions had correlations and/or percent agreements above 0.50 or 50%, respectively, with most questions above 0.60 or 60%. Paired *t* test analysis showed no significant differences between the means at time one and time two for all but two questions. Questions that showed significant differences

between the means at time one and time two were re-worded to improve clarity. Reliability of knowledge, attitude, and behavior scales in the personal factors survey were verified using Cronbach's alpha. Items that showed an inter-item correlation of > .70 were grouped together to create individual scales. The reliability of individual items was assessed only to strengthen the scale.

Analysis

Daily consumption of fruit and vegetables was derived by summing the product of the food frequency and portion size over all the food items listed for each food group. Analysis of the intervention effects was conducted using SPSS, version 14 (SPSS Inc., Chicago, Ill). A repeated-measure analysis of variance (ANOVA) was performed with groups as a between-subject factor and time of measurement (baseline, postintervention and four-month follow-up) as a within-subjects factor for all knowledge, attitude, behavior, and food frequency data. Gender and previous nutrition class enrollment were also included as between subject covariates. Significance was set at <0.05, but we also reported differences when alpha was less than 0.1 to better balance statistical type I and type II errors. When there was a significant interaction, the differences between groups were further examined using SAS, version 9.1 (SAS Inc., Cary, NC).

Intervention and control groups were compared using *t* tests on knowledge, attitude, and behavior variables to demonstrate equivalency at baseline. Chi-square was used to compare groups on the demographic variables. Chi square and *t* tests were also used to determine differences between program completers and those who failed to complete follow-up surveys.

SURVEY FINDINGS

Of the 114 students enrolled in the study, 101 completed with 50 students in the intervention group and 51 in the control group. At four-month follow-up 30 students remained in each group, meeting 90 percent power for nutrition knowledge (Shannon et al., 1979). Over half (63%) of the 101 students who participated in the study were female, and the majority (95%) of participants were juniors or seniors. Most (93%) reported living off campus in an apartment and 73% reported that they were not eating in the dining hall. There were no statistical significant differences between groups at baseline.

Over half (52%) of students reported cooking dinner four or more times a week. Sixty-six percent of students reported eating out three or more times a week. Participants' mean fruit and vegetable intake was 1.2 and 1.5 cups, respectively.

There were significant changes in knowledge in the intervention group compared to the control group post intervention and follow-up ($p<0.001$) (Table 1). The intervention group experienced a significant change in cooking motivators, barriers ($p<0.05$), and self-efficacy ($p<0.1$) from pre to post compared to the control group, but this increase was not maintained at follow-up (Table 1). There were no significant changes in fruit and vegetable motivators, barriers and self-efficacy in the intervention group compared to the control group. There were no significant changes in fruit and vegetable consumption nor cooking behaviors.

According to the program feedback survey, 61% of students in the intervention group agreed that they would like to view future episodes of *Good Grubbin'*. Eighty percent of viewers enjoyed the program series and 90% of viewers reported that they

were either very interested or somewhat interested in the topics that were covered on *Good Grubbin'*. Over half (55%) of the 51 viewers reported making a change in their eating habits as a result of watching the program. Of the 28 students who reported making a dietary change, 18 reported making changes related to increasing fruits and vegetables.

Thirty-five percent of the student viewers (n=18) reported attempting to make a recipe they saw on *Good Grubbin'* while 57% (n=29) reported visiting the website in order to obtain the recipes with a total of 59 reported visits to the Good Grubbin' website by students in the intervention group.

DISCUSSION

The study results provide evidence that exposure to the cooking and nutrition television program, *Good Grubbin'*, resulted in a change in knowledge with regards to the dietary recommendations for fruits and vegetables, which was maintained at follow-up. Significant changes in knowledge that resulted agreed with other published studies in televised nutrition research (Chew et al., 1995; Jenkins, 1975; Shannon et al., 1979; Smith & George, 2001).

There were no significant changes in motivations, barriers, and self efficacy of eating fruits and vegetables at follow-up. This result differed from Chew and colleagues who found significant changes in efficacy, health motivation, salience and confidence in information as a result of watching their program on heart-healthy nutrition, *Eat Smart* (Chew et al., 1998). It should be noted, however, that their study differed in that resources were insufficient to include a control group.

Results from the FFQ and personal factors survey indicate that there were no significant changes in fruit and vegetable intake or cooking patterns in the intervention group compared to the control group. This finding, while disappointing, is consistent with one other nutrition television research that tracked changes in food intake. Jenkins also failed to find significant changes in children's dietary intake based on three-day food records as a result of watching the program *Mulligan Stew* (Jenkins, 1975).

In response to an open-ended question in the program feedback survey that asked students in the intervention group to share any dietary changes that were made as a result of watching the program, 18 of the 50 respondents in the intervention group mentioned dietary changes that involved an increase in fruits and vegetables. One student related, "Since watching *Good Grubbin'* I have been trying to incorporate more fruits and vegetables into my diet. When I go to the grocery store to buy food I am more conscious about the types of items I am picking out." Another student reported, "I incorporate vegetables into breakfast now with breakfast burritos and scrambled eggs. I try to meet my need of two cups of fruits and two and a half cups of veggies everyday." Despite reports from 36% of students who stated that they attempted to increase fruits and vegetables as a result of watching the show, this increase was not apparent in the FFQ, suggesting that either there was reporter bias or that the FFQ tool was not sensitive enough to detect such changes.

Changes in knowledge from viewing this theory-driven cooking and nutrition program did not result in changes in attitudes and behaviors. Changing knowledge is an important step in the process of behavior change (Azjen & Fishbein, 1980; Contento et al., 1995). Despite efforts to provide viewers with meal planning and preparation skills

and maximize peer modeling, the program did not influence self efficacy, motivators or barriers to cooking or eating fruits and vegetables. Without significant changes in self-efficacy, it is unlikely that those participating in nutrition education programs will make recommended dietary changes (Rimal, 2000). While results from the program feedback survey with regards to behavior change are encouraging, it is likely that four 15-minute episodes was not a sufficient dose to significantly influence dietary behaviors long-term.

Students did respond positively to this form of nutrition education and would likely be influenced by a longer program series, as one might be exposed to on cable television. Well over half (61%) of the *Good Grubbin'* viewers reported interest in viewing future episodes of the program and the majority of participants in the intervention group enjoyed watching the *Good Grubbin'* series. Their enjoyment and interest in the program can be further illustrated by one student who shared, "I thought that the show had a lot of interesting information. It really hit the college demographics well. It really identified with the typical college lifestyle and eating habits."

In addition, over a third (35%) of participants actually attempted recipes seen on the show. The website provided over half (57%) of participants in the intervention group with additional exposure to the main messages and recipes viewed on the program. This suggests that through supplementing information viewed on television with the Internet, this may increase message exposure and allow viewers to revisit information learned at a later date. In addition, viewers can print off the recipes from the program with ease, increasing the likelihood that they will actually attempt the recipe seen on the show.

Limitations

There were a number of limitations to this study. Of the 166 students enrolled in the four upper division non-nutrition courses from which subjects were recruited, 101 self-selected to participate. During recruitment, students were told very little about the details of the intervention television program in an effort to minimize recruiting only those with previous interest in nutrition and cooking. However, as with any self-reported assessment, there is the potential for reporting errors and a bias toward socially desirable responses.

There was a significant drop-out rate at four-month follow-up with only 59% of the original participants completing the final surveys. Monetary incentives offered at four-month follow-up differed from the academic extra-credit incentive that was offered to the original 101 participants. This suggests that those who did not complete the study were either less driven by monetary gain or differed from study completers in their interest in nutrition. To rule out the later, survey scores of completers were compared to those who did not participate in follow-up using a chi square analysis and no significant differences were observed.

Finally, in this study students were asked to view assigned television programs on a computer with high speed internet access. This television viewing environment differs from a natural setting in that participants viewing episodes on a computer are likely more focused on the program they are viewing.

The cooking and nutrition television program provided some evidence to validate the program's hypotheses. Subjects in the intervention group experienced significant improvements in knowledge compared with the control group. There were no significant

differences among groups related to cooking and fruit and vegetable attitudes and behaviors. A larger dose may be necessary to see such changes. Given limited resources, a cooking and nutrition program may be a reasonable and cost-effective way to reach large audiences, especially on college campuses where television is a preferred source for obtaining dietary advice.

IMPLICATIONS FOR RESEARCH AND PRACTICE

College campuses offer several media outlets for nutrition education. The use of multiple media outlets, such as are often used in health education campaigns, may be more effective on influencing the behaviors of college students due to the chance of multiple message exposures (Contento et al., 1995; Gillespie & Yarbrough, 1984). Future research efforts using campus media channels could investigate the impact of nutrition interventions that utilize multiple channels at once such as a television program in conjunction with the website and weekly nutrition articles in the college newspaper.

With the continued increase in the popularity of cooking programs, this avenue may become a viable option for providing both college students and viewers of all ages with nutrition information. Recently, several nutrition-focused cooking programs have aired on cable networks (*Food Network Show List A-Z*). Future research should examine the impact these established programs have on the knowledge, attitudes, and behaviors of viewers. Through studying a televised program series that runs a typical 13 week season, researchers could determine if a larger dose of televised nutrition and cooking information is adequate to result in behavior change.

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Table 1. Mean scores by group and time (LS means (SE)).

Parameter	Group	n	Baseline	Post-Intervention	4-month Follow-up
Total Knowledge† (4 items)					
	Intervention	50	33.5% (3.3)	58.0% (3.6)[b]	
		30	31.7% (4.3)	60.8% (4.3)	53.3% (4.3) ***
	Control	51	25.5% (3.3)	33.8% (3.5)	
		30	27.5% (4.3)	32.5% (4.3)	36.7% (4.3)
Fruit Motivators and Barriers (9 items)‡					
	Intervention	50	6.20 (0.64)	6.56 (0.69)	
		30	5.90 (0.85)	5.97 (0.84)	5.97 (0.93)
	Control	51	5.26 (0.64)	6.04 (0.68)	
		30	5.47 (0.85)	6.80 (0.84)	7.10 (0.93)
Vegetable Motivators and Barriers (9 items)‡					
	Intervention	50	4.32 (0.70)	5.26 (0.78)	
		30	3.70 (0.89)	4.77 (0.96)	5.03 (0.95)
	Control	51	4.29 (0.69)	4.78 (0.77)	
		30	4.80 (0.89)	5.07 (0.96)	6.23 (0.95)
Fruit Self-Efficacy (10 items)§					
	Intervention	50	34.04 (0.94)	34.84 (1.00)	
		30	32.87 (1.18)	33.30 (1.28)	32.83 (1.33)
	Control	51	33.35 (0.93)	33.94 (0.99)	
		30	33.70 (1.18)	34.47 (1.28)	33.90 (1.33)

Parameter	Group	n	Baseline	Post-Intervention	4-month Follow-up
Vegetable Self-Efficacy (10 items)§					
	Intervention	50	34.10 (1.07)	35.44 (1.16)	
		30	32.80 (1.36)	34.17 (1.52)	33.37 (1.45)
	Control	51	34.18 (1.06)	33.69 (1.15)	
		30	34.60 (1.36)	33.77 (1.52)	34.53 (1.45)
Cooking Motivators and Barriers (6 items)‡					
	Intervention	50	1.38 (0.55)	2.62 (0.57)[a]	
		30	0.77 (0.71)	1.97 (0.74)	1.93 (0.60)
	Control	51	2.57 (0.54)	2.80 (0.57)	
		30	2.10 (0.71)	2.43 (0.74)	3.03 (0.60)
Cooking Self-Efficacy (4 items)§					
	Intervention	50	14.56 (0.41)	15.36 (0.43)[c]	
		30	14.37 (0.49)	14.83 (0.55)	15.03 (0.49)
	Control	51	14.82 (0.41)	14.98 (0.42)	
		30	14.87 (0.49)	15.07 (0.55)	15.67 (0.49)
FFQ Fruit					
	Intervention	50	1.30 (0.13)	1.08 (0.17)	
		30	1.26 (0.19)	1.02 (0.22)	1.31 (0.26)
	Control	51	1.09 (0.13)	1.24 (0.17)	
		30	1.16 (0.18)	1.30 (0.22)	1.22 (0.26)

Parameter	Group	n	Baseline	Post-Intervention	4-month Follow-up
FFQ Vegetable					
	Intervention	50	1.52 (0.16)	1.38 (0.15)	
		30	1.42 (0.21)	1.34 (0.20)	1.44 (0.21)
	Control	51	1.57 (0.16)	1.53 (0.15)	
		30	1.51 (0.21)	1.49 (0.19)	1.60 (0.21)
FFQ Total					
	Intervention	50	2.82 (0.25)	2.46 (0.30)	
		30	2.69 (0.34)	2.37 (0.38)	2.75 (0.41)
	Control	51	2.67 (0.25)	2.77 (0.29)	
		30	2.66 (0.34)	2.79 (0.38)	2.81 (0.40)

[a-c]The change from baseline to post-intervention for the control group was different from the change for the intervention group, [a]$p < .05$, [b]$p < .01$, [c]$p < .1$.
*The change from baseline to 4-month follow-up for the control group was different from the change for the intervention group, *$p < .1$, **$p < .05$, ***$p < .01$.
†Total knowledge as percent correct out of four questions.
‡ Based on a 5-point Likert scale (-2 to +2)
§ Based on a 5-point likert scale (+1 to +5)

CHAPTER 5: DISCUSSION

This is the first research to investigate the use of campus media channels to disseminate nutrition information on a college campus. Our research began with assessing the needs of the target audience. Following the analysis of our survey, a campus-specific media intervention was decided upon and program goals and objectives were developed. Television was selected as the media channel with which we would disseminate nutrition information on the campus of Colorado State University. A pilot nutrition education program was produced. Audience acceptance was assessed through formative evaluation. After necessary adjustments were made, a four-episode series was developed and an outcome evaluation was conducted to determine if the intervention met the original research objectives.

Needs Assessment Survey

Our research commenced with a needs assessment survey to determine college students most preferred campus-specific media channels for obtaining nutrition information as well as the health topics that are of most interest. This needs assessment was conducted in conjunction with a literature review to determine students' dietary inadequacies and knowledge insufficiencies. Simultaneously, the 2005 Dietary Guidelines were published, which guided the selection of health messages chosen for our intervention (*Dietary Guidelines for Americans, 2005, 6th ed*, 2005). These factors laid the groundwork for the goals and objectives for the intervention.

In an effort to determine the most appropriate campus media channel for delivering nutrition information to students, a series of five questions asked students their interest in receiving information via the campus newspaper, television station, website, radio station and email. A proposed intervention involving a weekly campus television program received mixed reviews with 42% of respondents reporting interest in watching a weekly program on nutrition, cooking and physical activity. This was likely related to the low viewership of the campus television station with only 2.4% of respondents reporting that they watch campus television always or often. The well-known poorer quality of local television stations may be a turn-off to potential viewers as these programs must compete with hundreds of cable channels that offer high definition television. Therefore, maintaining a high level of quality is critical when local media stations must compete with other channels.

Despite the reported low use of campus television, we selected this media outlet for our intervention for a number of reasons. First, we chose this form of communication over other proposed campus-media interventions due to accessibility. While other campus media interventions received more interest from survey respondents, there were limitations as to which campus media entities could accommodate a nutrition education intervention. For example, the campus newspaper intervention received the highest interest from students as an avenue for obtaining nutrition information, but due to policies restricting non-staff members from writing a weekly column, we were forced to rule out this delivery method. Unlike the campus newspaper staff, the campus television staff at Colorado State University was interested in assisting in the production of a nutrition and cooking program.

Second, we chose to develop a television program based on the results from the needs assessment survey that found college students prefer obtaining nutrition information from television over all other forms of mass media. Seventy-eight percent of the 169 students who participated in the needs assessment survey selected television as a desirable medium for obtaining nutrition information. This was statistically significantly higher than all other mass media channels. The popularity of television as a desirable medium for obtaining nutrition information agreed with research from the 1980's by Novascone and Hertzler (Novascone & Hertzler, 1986). When students were asked to identify all primary sources of nutrition information listed on a questionnaire, they rated mass media channels as their primary sources of nutrition information. Magazines, television, and radio were the most popular media channels accessed. Furthermore, research by Neilsen Media Research, Inc. suggests that television is a highly utilized media source by our target audience with college students averaging 24.3 hours of viewing time each week (James, 2006).

Program Development and Formative Evaluation

Communications using the media are effective if they are personally relevant to the issues that people confront (Contento et al., 1995). The use of systematic, audience-centered planning can greatly facilitate the design and delivery of community-based nutrition education to consumers.

The accessibility and reported media desires for obtaining nutrition information by our target audience justified the use of television as the selected media channel to disseminate nutrition information to students at Colorado State University. After

receiving support from the Campus Television station at Colorado State University, a pilot nutrition television program was developed and tested with the target audience in the form of focus groups.

This formative evaluation provided direction for the development of the program series. The intention was to include many different elements in the pilot program from which student feedback as to their style preferences could be obtained. We found that students preferred the unscripted segments over the scripted segments. A finding similar to that was reported by Alice Hall who also found during focus group discussions that young adults prefer the reality television programming style (Hall, 2006). Reality television is a genre of television programming which generally is unscripted, documenting actual events over fiction, and featuring non-professional actors (Hill, 2005). Reality television has been one of the biggest phenomena of recent television seasons (Carter & Rutenberg, 2003).

In addition, students preferred health messages in which someone is not talking at them, but rather demonstrating the skills necessary to incorporate nutritious foods into their meals and snacks. The cooking scenes were well-received by student audiences and included recipes that they felt were simple, and realistic. Results from these focus groups supported the recent trend in the popularity of cooking programs for young adult audiences. This information is consistent with focus group research in Great Britain by Caraher and colleagues in which participants stated that they did not want to be taught or 'force fed' health education messages, but instead wanted health advice and tips in short bursts that were in the context of the cooking show (Caraher et al., 2000). Therefore, it was verified that a cooking program format is an appropriate method for delivering health

and cooking advice. In fact, Caraher also found through surveying his British subjects that 30% of the 5,570 respondents often turn to cooking programs for information on cooking techniques.

Based on such findings, necessary changes were made to the program format to maximize audience acceptance of the final product. Changes included increasing the proportion of the program that was an unscripted cooking show style and replacing actors with real students who were portrayed as having real struggles with nutrition and cooking. A four show series was developed for the intervention. Evaluation tools were prepared to test the impact of the intervention on the target audience. Surveys were designed to specifically test the original hypotheses and to determine audience response to the television program series.

Intervention and Outcome Evaluation

Students exposed to the four-show series of *Good Grubbin'* were found to have significant changes in knowledge as a result of watching the programs compared to the control group. Significant changes in knowledge that resulted agreed with other published studies in televised nutrition research (Chew et al., 1995; Jenkins, 1975; Shannon et al., 1979; Smith & George, 2001).

This study confirmed that as there were no significant changes in motivations, barriers, and self efficacy of eating fruits and vegetables at follow-up. Nor were there significant changes in fruit and vegetables intake or cooking patterns in the intervention group compared to the control group. Chew and colleagues did find significant changes in efficacy, health motivation, salience and confidence in information as a result of

watching their program on heart-healthy nutrition, *Eat Smart* (Chew et al., 1998). However, their study design differed in that resources were insufficient to include a control group. One other nutrition television research that tracked changes in food intake. Jenkins also failed to find significant changes in children's dietary intake based on three day food records as a result of watching the program *Mulligan Stew* (Jenkins, 1975).

In response to an open-ended question in the program feedback survey that asked students in the intervention group to share any dietary changes that were made as a result of watching the show, 18 of the 50 respondents in the intervention group mentioned dietary changes that involved an increase in fruits and vegetables. Despite reports from 36% of students who stated that they attempted to increase fruits and vegetables as a result of watching the program, this increase was not apparent in the FFQ, suggesting that either there was reporter bias or that the FFQ tool was not sensitive enough to detect such changes.

Social Learning Theory. Results from the FFQ and personal factors survey supports the concept that changes in knowledge does not always result in changes in attitudes and behavior (Contento et al., 1995). Despite attempts to integrate all constructs of a behavior change theory into the intervention, changes in behavior did not result. Strategies used to apply the Social Learning Theory constructs were not sufficient. For example, one way in which reciprocal determinism was addressed was through filming students in places they frequent (i.e. kitchen and grocery store) and interviewing them explaining personal factors that influence their behaviors. However, another piece of their environment that was not addressed was how the social norm influences their choices. Social norm plays a role in the attitudes and opinions of the audience (Azjen & Fishbein,

1980). Thus, college students are more likely to change their dietary behaviors if they think recommended changes would be acceptable to their peers. In order to address social norms in this intervention, a wide-spread campus media campaign would be necessary.

Simply demonstrating cooking and meal planning strategies was not sufficient in influencing changes in attitudes and behaviors regarding fruits, vegetables, and cooking. While students in the intervention group received awareness knowledge and "how to" knowledge, viewing these behavioral skills was inadequate. This is likely due to the fact that viewers did not participate in hands-on activities. Active participation is important in building self efficacy. A significant limitation to using televised nutrition education in the form of a cooking program is that viewers do not actively participate in the food demonstrations. In a study by Levy and Auld, college students who participated in a series of hands-on cooking classes increased their confidence in using certain cooking skills compared to students who simply viewed a cooking demonstration (Levy & Auld, 2004). It is possible that significant behavior changes would have occurred, had there been a hands-on component added to a media-based intervention. Viewers could be asked to send in their own cooking tips and recipes to be posted on a supplementary website. This one example of how a hands-on learning component could be added to enhance this intervention to improve viewer self-efficacy.

Additional results from the program feedback survey support future use of television as a means to educate college students on nutrition. Well over half (61%) of the *Good Grubbin'* viewers reported interest in viewing future episodes of the program and

the majority of participants in the intervention group enjoyed watching the *Good Grubbin'* series. Their enjoyment and interest in the program can be further illustrated by one student who shared, "I thought that the show had a lot of interesting information. It really hit the college demographics well. It really identified with the typical college lifestyle and eating habits."

In addition, over a third (35%) of participants actually attempted recipes seen on the program. One student shared, "I loved the show! I already printed out the recipe and am going to the store on the way home. Thanks! I am sad that this is the last show. I want new recipes all the time... Thank you!" The website provided over half (57%) of participants in the intervention group with additional exposure to the main messages and recipes viewed on the program.

A supplementary website is an essential feature of a cooking program for college students as research by Jones suggests that college students are early adopters and heavy users of the Internet. Additional testing is needed to ensure the format of supplementary interactive multimedia is adequate to meet the needs of the target audience.

Implementation of *Good Grubbin'*

Following the testing phase of this project, *Good Grubbin'* was aired on Campus Television. Campus Television advertised the program, which was aired weekly for eight weeks. No additional research was conducted to determine audience exposure or interest in the program series.

Limitations

In addition to the limitations discussed in each manuscript, other limitations need to be addressed. The needs assessment survey and focus groups were conducted with a convenience sample of students in a freshman-level core curriculum courses. Students in core curriculum courses represent a variety of academic interests; however these students tend to be mostly underclassman. In fact, 70.5% of needs assessment survey respondents identified themselves as freshman or sophomores. This audience differed from the students who participated in the final intervention, of which 95% were juniors or seniors. The program that was developed was intended for students who live independently and are responsible for planning and preparing their own meals off campus. Consequently, students were recruited from upper-division classes. The media preferences of the upperclassmen and women in the intervention may differ from the media preferences of the underclass students who participated in the needs assessment survey and focus groups.

CHAPTER 6: CONCLUSIONS AND IMPLICATIONS FOR FUTURE RESEARCH

Conclusions

The purpose of this research was to determine appropriate methods for delivering a media-based nutrition intervention on a college campus. In addition, we assessed the impact of a theory-driven nutrition-oriented televised cooking program on the knowledge, attitudes and reported behaviors of college student recipients. The objective of the televised nutrition intervention was to provide students with the knowledge, skills and self-efficacy to plan and prepare meals and to increase their fruit and vegetable intake. This research is one of few studies investigating the impact of televised nutrition education that utilized a pretest-posttest control group design. The results from this research suggests that a four-episode theory-based television series influences knowledge of fruit and vegetable intake, but does not impact attitudes and behaviors regarding fruits, vegetables and cooking.

It was also found that this means of dissemination was well-liked by the target audience. Most study participants shared that they enjoyed watching the program and related well to concepts discussed on the shows.

It is evident that college students thirst for information on cooking. Television seems to be a popular means to obtain information on nutrition and cooking. The 21st Century has witnessed a significant increase in the number of cooking programs shown

on television (de Solier, 2005) Many of these programs also provide nutrition information (*Food Network Show List A-Z*).

Students' interest in obtaining information on cooking and meal planning was a reoccurring theme throughout all phases of this project. In the needs assessment survey 74% of respondents reported that they were interested in receiving information on easy cooking ideas. This finding was reinforced during our formative evaluation. Focus group participants enjoyed the cooking segment and found the information to be useful and entertaining. Changes were made to the final show series to make *Good Grubbin'* primarily a cooking program. Consequently, feedback from the intervention supported this change with 80% of students reporting that they enjoyed the program and 35% of students reporting that they actually tried recipes seen on the show.

Implications for Future Research

College campuses have the resources to offer several media outlets for nutrition education. However, in order to maintain media-based nutrition education programming, additional money and collaboration are needed. For example, health professionals employed at university health centers can collaborate with student media organizations. Financial resources necessary for media production can be obtained from student health organizations, whose primary goal is to promote health on campus. Another outlet for obtaining additional resources is through the solicitation of local food–focused companies such as restaurants and grocery stores.

The use of multiple media outlets, such as are often used in health education campaigns may be more effective in influencing the behaviors of college students then

the use of a single media channel. Future research efforts using campus media channels could investigate the impact of nutrition interventions that utilize multiple channels at once as part of a campus media campaign. For example, a campaign encouraging increased fruit and vegetable intake may include a television program such as *Good Grubbin'*, coupled with weekly articles published in the campus newspaper featuring recipes from the show. The university website could offer a link so that the newspaper articles and programs could be viewed on the computer. Finally, posters could be posted around campus with tips on incorporating fruits and vegetables into meals and snacks along with information regarding the dates and times of the next television program as well as the website url.

Multiple media channels can work together to provide audiences with multiple message exposure, potentially improving the outcome of such nutrition education efforts (Contento et al., 1995; Gillespie & Yarbrough, 1984). In studies of health campaigns in which media channels were used to disseminate information, behaviors in the intervention groups changed significantly when compared to the control groups (Farquahar et al., 1990; Reger et al., 1999; Snyder et al., 2000).

Additional research is also needed in televised nutrition education to determine how changes in behavior relate to the Transtheoretical Model of Change by Prochaska and colleagues (Prochaska, DiClemente, & Norcross, 1992). This model, also known as The Stages of Change model, shows that for most persons, a change in behavior occurs gradually. The patient moves from being uninterested, unaware or unwilling to make a change (precontemplation), to considering a change (contemplation), to deciding and preparing to make a change (preparation). Once the action is taken, attempts to maintain

the new behavior occur. Relapses are almost inevitable and become part of the process of working toward life-long change. Addressing the specific issues of relevance to individuals at their stage of readiness to change has been found to be more effective than addressing general nutrition issues (Contento et al., 1995).

With the continued increase in the popularity of cooking programs, this avenue may become a viable option for providing both college students and viewers of all ages with nutrition information. Recently, several nutrition-focused cooking programs have aired on cable networks (*Food Network Show List A-Z*). Future research should examine the impact these established programs have on the knowledge, attitudes, and behaviors of viewers. Through studying a televised program series that runs a typical 13 week season, researchers could determine if a larger dose of televised nutrition and cooking information is adequate to result in behavior change.

This was the first study to investigate the impact of a cooking show style program. While college students seem to be an obvious audience for this type of program with their limited cooking and meal planning skills, audiences of other age groups may also benefit from watching these programs. Future research should investigate the impact nutrition-focused cooking programs have on older audiences.

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APPENDICES

Appendix A: Needs Assessment Survey

1) Circle the age group that best describes you.

   a. 18 or younger
   b. 19-22
   c. 23-26
   d. 26-30
   e. >30

2) Circle your gender.

   Male Female

3) What year are you in school (circle one)?

   Freshman Sophmore Junior Senior Graduate

4) Do you live on campus or off campus? (circle one)

   On campus Off Campus

5) Check the box that best describes how often you seek information about nutrition, cooking, or exercise.

How often do you look for information about...	ALWAYS (daily)	OFTEN (weekly)	OCCASIONALLY (a few times per month)	SELDOM (a few times per semester)	NEVER
Nutrition					
Exercise					
Cooking techniques or recipes					

6) **Check the box that explains how often you use the following CSU media resources.**

How often do you...	ALWAYS (daily)	OFTEN (weekly)	OCCASIONALLY (a few times per month)	SELDOM (a few times per semester)	NEVER
Watch campus television (CTV)					
Read CSU's newspaper (The Collegian)					
View CSU's website					
Listen to CSU's radio station (KCSU)					

7) **Do you trust NUTRITION information in the media to be accurate? Check the box that applies in each situation.**

Do you trust nutrition information from...	Don't trust the information at all	Trust some of the information	Neither trust nor distrust the information	Trust most of the information	Trust all the information
Television newscasts					
Newspapers					
Magazines					
Internet					
Radio					

8) **Check the boxes that most accurately describe your knowledge of the following subjects.**

	Strongly Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Strongly Disagree
I know how to use the food guide pyramid to plan a healthy diet					
I know how to read a food label					
I know how to cook on a budget					

9) **How do you prefer to receive information about nutrition through the media? Check the box that applies to you for each type of media.**

	LESS DESIRABLE	SOMEWHAT DESIRABLE	MORE DESIRABLE
Reading newspaper articles about nutrition			
Reading articles on your email about nutrition			
Reading an article on the internet about nutrition			
Watching information about nutrition on television			
Watching short downloadable videos on the internet about nutrition			
Listening to information about nutrition on the radio			

Now that we know how you would prefer to obtain nutrition information from the media, we would like to ask you a few questions about your interest in some possible media projects at CSU.

10) If you had the option to receive one monthly article about nutrition, cooking techniques/recipes and exercise over email at no charge, would you be interested in this option? (Circle the letter of the statement that applies to you.)

a. Yes, I would be very interested
b. Yes, I would be somewhat interested
c. No, I don't think I would be interested
d. No, I absolutely would not be interested

11) If there was a new 30 minute show on Campus Television (CTV) about nutrition, exercise, and cooking, would you be interested in watching it? (Circle the letter of the statement that applies to you.)

a. Yes, I would be very interested
b. Yes, I would be somewhat interested
c. No, I don't think I would be interested
d. No, I absolutely would not be interested

12) If 5-minute videos about nutrition, exercise, and cooking techniques were available to view on the CSU website, would you be interested in viewing them? (Circle the letter of the statement that applies to you.)

a. Yes, I would be very interested
b. Yes, I would be somewhat interested
c. No, I don't think I would be interested
d. No, I absolutely would not be interested

13) If a weekly show about nutrition, exercise, and cooking was aired on CSU's radio station (KCSU), would you be interested in listening to it if it was on at a convenient time? (Circle the letter of the statement that applies to you.)

a. Yes, I would be very interested
b. Yes, I would be somewhat interested
c. No, I don't think I would be interested
d. No, I absolutely would not be interested

14) If a weekly article about nutrition, exercise and cooking was published in the Collegian Newspaper, would you be interested in reading it? (Circle the letter of the statement that applies to you.)

a. Yes, I would be very interested
b. Yes, I would be somewhat interested
c. No, I don't think I would be interested
d. No, I absolutely would not be interested

15) Which of the following topics interest you? Check the box that applies to your interest for each topic.

	VERY INTERESTED	SOMEWHAT INTERESTED	NOT INTERESTED
Nutrition			
Weight loss			
Cancer prevention			
Eating disorders			
Bone health			
Weight gain			
Vitamins			
Minerals			
Breakfast on the Run			
Fad Diets			
Diabetes Prevention			
Eating healthy while eating out			
Heart disease prevention			
Eating more fruits and vegetables			
Herbs (Alternative Medicine)			
Supplements			
Sports nutrition			
Vegetarian nutrition			
Effects of binge drinking			
Caffeine			
Processed foods			
Benefits of fiber			
Eating healthy on campus			
Nutrition to boost your immune system			
Portion sizes			
Grocery shopping tips			
Healthy fast food choices			

	VERY INTERESTED	SOMEWHAT INTERESTED	NOT INTERESTED
Cooking			
Easy cooking ideas			
Making recipes healthier			
Quick nutritious meals			
Meal planning			
Cooking on a budget			

Exercise			
Exercise Tips			

Thank you for your participation.

Appendix B: Focus Group Moderator Script

Focus Group Moderator Guide

5. I'd like to begin by asking you to tell us your name and tell us your favorite television show and what you like about it. _____.
6. What do you think about Campus Television? What shows have you watched on Campus Television?
7. What do you think about educational shows such as those you might find on PBS, the Discovery Channel or the Food Network?
8. What do you think about cooking shows?
    b. To those who say they watch cooking shows- what type of cooking shows do you like?

Play 30-minute pilot episode

5. The show you just saw is a cooking show aimed at college students. It will be aired in the spring of 2006. How likely are you to watch a show like this?
    a. If you are likely to watch shows like this, what do you expect to get out of watching these types of shows?
    b. If you are not likely to watch shows like this, what would get you to watch more shows like this?
6. What did you like best about the show you just saw?
    b. What was most interesting (or new) to you?
7. What did you like least about the show?
    c. What was least interesting (or new) to you?
    d. If you were the producer, what changes would you make for future episodes?
8. The tentative title of the show is Good Grubbin'. What do you think of the title?
10. What did you think about the characters on the show?
    a. In what ways did you find that you could relate to the people on the show?
    b. For those of you who don't relate to the people on the show, how do you think that you were different than the people on the show?
10. What topics do you think should be covered on future shows?
11. How likely are you to visit the website to view tips and recipes? What information would you like to see on the website?
12. What other advice do you have to help us make the program better? Is there anything that we missed? Of all the things that we've discussed, what do you feel is the most important for the success of the show?

Appendix C: Food Frequency Questionnaire

Please select only one answer for each question by circling the letter that applies to your eating habits. The following questions are regarding your intake of fruits

1. Over the past month, how often did you eat oranges or grapefruit (not juice)?

    a) Never [Skip to question 3]
    b) 1-3 times a month
    c) 1-2 times a week
    d) 3-4 times a week
    e) 5-6 times a week
    f) 1 time a day
    g) 2 times a day or more
    h) Don't Know

2. How much was your usual serving size for oranges or grapefruits (not juice)?

    a) ½ the size of a tennis ball
    b) About the size of a tennis ball
    c) 1 ½ times the size of a tennis ball
    d) 2 times the size of a tennis ball
    e) Greater than 2 times the size of a tennis ball
    f) Don't Know
    g) Not Applicable

3. Over the past month, how often did you eat an apple or applesauce?

    a) Never [Skip to question 5]
    b) 1-3 times a month
    c) 1-2 times a week
    d) 3-4 times a week
    e) 5-6 times a week
    f) 1 time a day
    g) 2 times a day or more
    h) Don't Know

4. How much was your usual serving size of apples or applesauce?

    a) ½ the size of a tennis ball
    b) About the size of a tennis ball
    c) 1 ½ times the size of a tennis ball
    d) 2 times the size of a tennis ball
    e) Greater than 2 times the size of a tennis ball
    f) Don't Know
    g) Not Applicable

5. Over the past month, how often did you eat peaches, nectarines, or plums?

    a) Never [Skip to question 7]
    b) 1-3 times a month
    c) 1-2 times a week
    d) 3-4 times a week
    e) 5-6 times a week
    f) 1 time a day
    g) 2 times a day or more
    h) Don't Know

6. How much was your usual serving size of peaches, nectarines, or plums?

    a) ½ the size of a tennis ball
    b) About the size of a tennis ball
    c) 1 ½ times the size of a tennis ball
    d) 2 times the size of a tennis ball
    e) Greater than 2 times the size of a tennis ball
    f) Don't Know
    g) Not Applicable

7. Over the past month, how often did you eat berries such as strawberries or blueberries?

    a) Never [Skip to question 9]
    b) 1-3 times a month
    c) 1-2 times a week
    d) 3-4 times a week
    e) 5-6 times a week
    f) 1 time a day
    g) 2 times a day or more
    h) Don't Know

8. How much was your usual serving size of berries such as strawberries or blueberries?
    a) ½ the size of a tennis ball
    b) About the size of a tennis ball
    c) 1 ½ times the size of a tennis ball
    d) 2 times the size of a tennis ball
    e) Greater than 2 times the size of a tennis ball
    f) Don't Know
    g) Not Applicable

9. Over the past month, how often did you eat other fresh fruits such as grapes, pears, or pineapple?

    a) Never [Skip to question 11]
    b) 1-3 times a month
    c) 1-2 times a week
    d) 3-4 times a week
    e) 5-6 times a week
    f) 1 time a day
    g) 2 times a day or more
    h) Don't Know

10. How much was your usual serving size of other fresh fruits such as grapes, pears, or pineapple?

    a) ½ the size of a tennis ball
    b) About the size of a tennis ball
    c) 1 ½ times the size of a tennis ball
    d) 2 times the size of a tennis ball
    e) Greater than 2 times the size of a tennis ball
    f) Don't Know
    g) Not Applicable

11. Over the past month, how often did you eat dried fruits, such as raisins, prunes, or apricots?

    a) Never [Skip to question 13]
    b) 1-3 times a month
    c) 1-2 times a week
    d) 3-4 times a week
    e) 5-6 times a week
    f) 1 time a day
    g) 2 times a day or more
    h) Don't Know

12. How much was your usual serving size of dried fruits, such as raisins, prunes, apricots?

    a) ½ the size of a tennis ball
    b) About the size of a tennis ball
    c) 1 ½ times the size of a tennis ball
    d) 2 times the size of a tennis ball
    e) Greater than 2 times the size of a tennis ball
    f) Don't Know
    g) Not Applicable

13. Over the past month, how often did you eat fruit salad, canned fruit, or fruit cocktail?

    a) Never [Skip to question 15]
    b) 1-3 times a month
    c) 1-2 times a week
    d) 3-4 times a week
    e) 5-6 times a week
    f) 1 time a day
    g) 2 times a day or more
    h) Don't Know

14. How much was your usual serving size of fruit salad, canned fruit, or fruit cocktail?

    a) ½ the size of a tennis ball
    b) About the size of a tennis ball
    c) 1 ½ times the size of a tennis ball
    d) 2 times the size of a tennis ball
    e) Greater than 2 times the size of a tennis ball
    f) Don't Know
    g) Not Applicable

For the next few fruits, we will use different serving sizes.

15. Over the past month, how often did you eat a banana?

    a) Never [Skip to question 17]
    b) 1-3 times a month
    c) 1-2 times a week
    d) 3-4 times a week
    e) 5-6 times a week
    f) 1 time a day
    g) 2 times a day or more
    h) Don't Know

16. How much was your usual serving size for a banana?

    a) ½ medium banana
    b) 1 medium banana
    c) 1 ½ medium bananas
    d) 2 medium bananas
    e) Greater than 2 medium bananas
    f) Don't Know
    g) Not Applicable

17. Over the past month, how often did you eat cantaloupe, honeydew, or melon?

    a) Never [Skip to question 19]
    b) 1-3 times a month
    c) 1-2 times a week
    d) 3-4 times a week
    e) 5-6 times a week
    f) 1 time a day
    g) 2 times a day or more
    h) Don't Know

18. How much was your usual serving size for cantaloupe, honeydew, or melon?

a) 1/8 medium melon
b) ¼ medium melon
c) ½ medium melon
d) ¾ medium melon
e) 1 whole melon
f) Greater than 1 whole melon
g) Don't Know
h) Not Applicable

19. Over the past month, how often did you eat watermelon?

a) Never [Skip to question 21]
b) 1-3 times a month
c) 1-2 times a week
d) 3-4 times a week
e) 5-6 times a week
f) 1 time a day
g) 2 times a day or more
h) Don't Know

20. Was your usual serving a small slice or wedge, a medium slice or wedge, or a large slice or wedge?

a) a small slice or wedge
b) a medium slice or wedge
c) a large slice or wedge
d) Don't Know
e) Not Applicable

For the next few fruits, we will use different serving sizes.

21. Over the past month, how often did you DRINK 100% orange juice? (Do NOT include drinks like Sunny Delight, Hi C, Koolaid, lemonade, or Snapple.)

a) Never [Skip to question 23]
b) 1-3 times a month
c) 1-2 times a week
d) 3-4 times a week
e) 5-6 times a week
f) 1 time a day
g) 2 times a day or more
h) Don't Know

22. How much was your usual serving size for 100% orange juice?

a) 4 oz glass (1/2 cup)
b) 6 oz glass (3/4 cup)
c) 8 oz glass (1 cup)
d) 12 oz glass (1 ½ cup)
e) 16 oz glass (2 cups)

f) Greater than a 16 oz glass (greater than 2 cups)
g) Don't Know
h) Not Applicable

23. Over the past month, how often did you DRINK other 100% fruit juice such as apple, grapefruit, or cranberry? (Do NOT include drinks like Sunny Delight, Hi C, Koolaid, lemonade, or Snapple.)

a) Never [Skip to question 25]
b) 1-3 times a month
c) 1-2 times a week
d) 3-4 times a week
e) 5-6 times a week
f) 1 time a day
g) 2 times a day or more
h) Don't Know

24. How much was your usual serving size for other 100% fruit juice such as apple, grapefruit, or cranberry?

a) 4 oz glass (1/2 cup)
b) 6 oz glass (3/4 cup)
c) 8 oz glass (1 cup)
d) 12 oz glass (1 ½ cup)
e) 16 oz glass (2 cups)
f) Greater than a 16 oz glass (greater than 2 cups)
g) Don't Know
h) Not Applicable

The following questions are regarding your intake of vegetables.

25. Over the past month, how often did you eat french fries, fried potatoes, or hash browns?

a) Never [Skip to question 27]
b) 1-3 times a month
c) 1-2 times a week
d) 3-4 times a week
e) 5-6 times a week
f) 1 time a day
g) 2 times a day or more
h) Don't Know

26. How much was your usual serving size of french fries, fried potatoes, or hash browns?

a) ½ the size of a tennis ball
b) About the size of a tennis ball
c) 1 ½ times the size of a tennis ball
d) 2 times the size of a tennis ball
e) Greater than 2 times the size of a tennis ball
f) Don't Know
g) Not Applicable

27. Over the past month, how often did you eat other potatoes such as baked, mashed or sweet potatoes?

a) Never [Skip to question 29]
b) 1-3 times a month
c) 1-2 times a week
d) 3-4 times a week
e) 5-6 times a week
f) 1 time a day
g) 2 times a day or more
h) Don't Know

28. How much was your usual serving size of other potatoes such as baked, mashed or sweet potatoes?

a) ½ the size of a tennis ball
b) About the size of a tennis ball
c) 1 ½ times the size of a tennis ball
d) 2 times the size of a tennis ball
e) Greater than 2 times the size of a tennis ball
f) Don't Know
g) Not Applicable

29. Over the past month, how often did you eat peas, green beans, or lima beans?

a) Never [Skip to question 31]
b) 1-3 times a month
c) 1-2 times a week
d) 3-4 times a week
e) 5-6 times a week
f) 1 time a day
g) 2 times a day or more
h) Don't Know

30. How much was your usual serving size of peas, green beans, or lima beans?

a) ½ the size of a tennis ball
b) About the size of a tennis ball
c) 1 ½ times the size of a tennis ball
d) 2 times the size of a tennis ball
e) Greater than 2 times the size of a tennis ball
f) Don't Know
g) Not Applicable

31. Over the past month, how often did you eat refried beans, chili beans, etc.?

a) Never [Skip to question 33]
b) 1-3 times a month
c) 1-2 times a week
d) 3-4 times a week
e) 5-6 times a week
f) 1 time a day
g) 2 times a day or more
h) Don't Know

32. How much was your usual serving size of refried beans, chili beans, etc.?

a) ½ the size of a tennis ball
b) About the size of a tennis ball
c) 1 ½ times the size of a tennis ball
d) 2 times the size of a tennis ball
e) Greater than 2 times the size of a tennis ball
f) Don't Know
g) Not Applicable

33. Over the past month, how often did you eat carrots?

a) Never [Skip to question 35]
b) 1-3 times a month
c) 1-2 times a week
d) 3-4 times a week
e) 5-6 times a week
f) 1 time a day
g) 2 times a day or more
h) Don't Know

34. How much was your usual serving size of carrots?

a) ½ the size of a tennis ball (equivalent to 5 mini carrots)
b) About the size of a tennis ball (equivalent to 10 mini carrots)
c) 1 ½ times the size of a tennis ball (equivalent to 15 mini carrots)
d) 2 times the size of a tennis ball (equivalent to 20 mini carrots)
e) Greater than 2 times the size of a tennis ball (greater than 20 mini carrots)
f) Don't Know
g) Not Applicable

35. Over the past month, how often did you eat broccoli, cauliflower, spinach, or greens? (These include cooked greens like collard, beet, and kale)

a) Never [Skip to question 37]
b) 1-3 times a month
c) 1-2 times a week
d) 3-4 times a week
e) 5-6 times a week
f) 1 time a day
g) 2 times a day or more
h) Don't Know

36. How much was your usual serving size of broccoli, cauliflower, spinach, or greens?

a) ½ the size of a tennis ball
b) About the size of a tennis ball
c) 1 ½ times the size of a tennis ball
d) 2 times the size of a tennis ball
e) Greater than 2 times the size of a tennis ball
f) Don't Know
g) Not Applicable

37. Over the past month, how often did you eat...pickles, onions, cucumber, celery, or olives?

a) Never [Skip to question 39]
b) 1-3 times a month
c) 1-2 times a week
d) 3-4 times a week
e) 5-6 times a week
f) 1 time a day
g) 2 times a day or more
h) Don't Know

38. How much was your usual serving size of pickles, onions, cucumber, celery, or olives?

a) ½ the size of a tennis ball
b) About the size of a tennis ball
c) 1 ½ times the size of a tennis ball
d) 2 times the size of a tennis ball
e) Greater than 2 times the size of a tennis ball
f) Don't Know
g) Not Applicable

39. Over the past month, how often did you eat tomato sauce, spaghetti sauce, or pizza sauce?

a) Never [Skip to question 41]
b) 1-3 times a month
c) 1-2 times a week
d) 3-4 times a week
e) 5-6 times a week
f) 1 time a day
g) 2 times a day or more
h) Don't Know

40. How much was your usual serving size of tomato sauce, spaghetti sauce, or pizza sauce?

a) ½ the size of a tennis ball
b) About the size of a tennis ball
c) 1 ½ times the size of a tennis ball
d) 2 times the size of a tennis ball
e) Greater than 2 times the size of a tennis ball
f) Don't Know
g) Not Applicable

41. Over the past month, how often did you eat green salad or lettuce?

a) Never [Skip to question 43]
b) 1-3 times a month
c) 1-2 times a week
d) 3-4 times a week
e) 5-6 times a week
f) 1 time a day
g) 2 times a day or more
h) Don't Know

42. How much was your usual serving size of green salad or lettuce?

a) ½ the size of a tennis ball
b) About the size of a tennis ball
c) 1 ½ times the size of a tennis ball
d) 2 times the size of a tennis ball
e) Greater than 2 times the size of a tennis ball
f) Don't Know
g) Not Applicable

43. Over the past month, how often did you eat mixed vegetables, such as frozen, canned, or vegetables mixed in foods such as pizza, tacos, or stir fry?

a) Never [Skip to question 45]
b) 1-3 times a month
c) 1-2 times a week
d) 3-4 times a week
e) 5-6 times a week
f) 1 time a day
g) 2 times a day or more
h) Don't Know

44. How much was your usual serving size of mixed vegetables, such as frozen, canned, or vegetables mixed in foods such as pizza, tacos, or stir fry?

a) ½ the size of a tennis ball
b) About the size of a tennis ball
c) 1 ½ times the size of a tennis ball
d) 2 times the size of a tennis ball
e) Greater than 2 times the size of a tennis ball
f) Don't Know
g) Not Applicable

45. Over the past month, how often did you eat other vegetables like corn, peppers, or coleslaw?

a) Never [Skip to question 47]
b) 1-3 times a month
c) 1-2 times a week
d) 3-4 times a week
e) 5-6 times a week
f) 1 time a day
g) 2 times a day or more
h) Don't Know

46. How much was your usual serving size of vegetables like corn, peppers, or coleslaw?

a) ½ the size of a tennis ball
b) About the size of a tennis ball
c) 1 ½ times the size of a tennis ball
d) 2 times the size of a tennis ball
e) Greater than 2 times the size of a tennis ball
f) Don't Know
g) Not Applicable

For the remaining vegetables, I will give you some serving size choices that are different from serving sizes listed in previous questions.

47. Over the past month, how often did you eat salsa?

a) Never [Skip to question 49]
b) 1-3 times a month
c) 1-2 times a week
d) 3-4 times a week
e) 5-6 times a week
f) 1 time a day
g) 2 times a day or more
h) Don't Know

48. How much was your usual serving size of salsa?

a) ¼ the size of a tennis ball
b) ½ the size of a tennis ball
c) About the size of a tennis ball
d) Greater than the size of a tennis ball
e) Don't Know
f) Not Applicable

49. Over the past month, how often did you eat tomatoes?

a) Never [Skip to question 51]
b) 1-3 times a month
c) 1-2 times a week
d) 3-4 times a week
e) 5-6 times a week
f) 1 time a day
g) 2 times a day or more
h) Don't Know

50. How much was your usual serving size of tomatoes?

a) ½ medium tomato
b) 1 medium tomato
c) 1 ½ medium tomato
d) 2 medium tomatoes
e) Greater than 2 medium tomatoes
f) Don't Know
g) Not Applicable

51. Over the past month, how often did you eat vegetable soup, stew, or vegetable drinks (such as V-8)?

a) Never [Skip question 52, you are finished]
b) 1-3 times a month
c) 1-2 times a week
d) 3-4 times a week
e) 5-6 times a week
f) 1 time a day
g) 2 times a day or more
h) Don't Know

52. How much was your usual serving size of vegetable soup, stew, or vegetable drinks?

a) 4 ounce cup or bowl (1/2 cup)
b) 6 ounce cup or bowl (3/4 cup)
c) 8 ounce cup or bowl (1 cup)
d) 12 ounce cup or bowl (1 ½ cups)
e) 16 ounce cup or bowl (2 cups)
f) Greater than a 16 ounce cup or bowl (greater than 2 cups)
g) Don't Know
h) Not Applicable

The End. Thank you for completing this survey.

Appendix D: Personal Factors Survey

Name: _____

We would like to find out more about you. Check one answer for each question.

1. What is your age group?
   - ☐ 17 or younger
   - ☐ 18-20
   - ☐ 21-23
   - ☐ 24-26
   - ☐ 27-29
   - ☐ >30

2. What is your gender?

   ☐ Female ☐ Male

3. What year are you in school?

   - ☐ High School
   - ☐ Freshman
   - ☐ Sophomore
   - ☐ Junior
   - ☐ Senior
   - ☐ Graduate
   - ☐ Other

4. Which of the following best describes your living arrangements?

   - ☐ Off campus in an apartment or house alone or with friends/roommates
   - ☐ Off campus in an apartment or house with your parents
   - ☐ Off campus in a sorority or fraternity
   - ☐ On campus in a residence hall (dorm)
   - ☐ On campus in an apartment or married housing

5. Have you eaten in a residence hall dining facility on campus this school year (not including the student center food court)?

   - ☐ Yes
   - ☐ No

6. Are you currently taking a college-level nutrition class?

   ☐ Yes ☐ No

7. Have you taken a college-level nutrition class in the past?

   ☐ Yes ☐ No

We would like to find out what you know about nutrition. Circle only one letter for each question.

8. According to the new dietary guidelines, when following a 2,000 calorie diet, how many cups of fruits and vegetables should you eat each day?

   a. 1 ½ cups of fruit and 2 cups of vegetables
   b. 2 cups of fruit and 2 ½ cups of vegetables
   c. 3 ½ cups of fruit and 4 cups of vegetables
   d. 5 cups of fruit and 6 cups of vegetables

9. Which of the following are **true** about fruits?

   a. Fruits canned in syrup contain more calories than fruits canned in juice
   b. Frozen fruits are not as nutritious as fresh fruits
   c. Fruits are low in calories and high in fiber
   d. Both a and c are true
   e. All of the above are true

10. Which of the following statements are **true** concerning vegetables?

    a. Canned and frozen vegetables have similar nutrients as fresh vegetables
    b. Canned vegetables lose a lot of nutrients through the canning process
    c. Frozen vegetables contain less fiber than fresh vegetables
    d. Both b and c are true
    e. Both a and c are true

11. Which of the following are considered vegetables?

    a. beans
    b. salsa
    c. tortilla chips
    d. ketchup
    e. Both a and b are considered vegetables
    f. All of the above foods are considered vegetables

The following questions pertain to your eating habits. Circle only one answer.

12. How many cups of vegetables do you eat on average each day? (For reference, a ½ cup is the size of a tennis ball.)

a. None
b. ½ cup
c. 1 cup
d. 1 ½ cups
e. 2 cups
f. 2 ½ cups
g. 3 cups
h. 3 ½ cups
i. 4 cups
j. 4 ½ cups
k. 5 cups
l. >5 cups

13. How many cups of fruit do you eat on average each day? (For reference, a ½ cup is the size of a tennis ball.)

a. None
b. ½ cup
c. 1 cup
d. 1 ½ cups
e. 2 cups
f. 2 ½ cups
g. 3 cups
h. 3 ½ cups
i. 4 cups
j. 4 ½ cups
k. 5 cups
l. >5 cups

14. Which of the following describes how often you eat food from a food establishment (ie. at a restaurant, campus food court, and take-out meals)?

a. 0-2 times a week
b. 3-5 times a week
c. 6-8 times a week
d. 9-11 times a week
e. >11 times a week

15. How many times a week do you...(please write in the number (0-7) for each box)

	Cook or prepare meals*	**Eat pre-made meals****	**Eat out or eat take out (including LSC food court)**	**Eat in a dining hall on campus**	**Skip (don't eat)**	**Total**
Breakfast						=7
Lunch						=7
Dinner						=7

*cook or prepare includes cereal, making sandwiches, and cooking from basic ingredients.
**eat pre-made meal includes breakfast bars, yogurt, frozen dinner, frozen pizzas, etc.

The following questions will tell us more about your barriers and motivators to eating fruits and vegetables.

16. Check the box that describes your agreement or disagreement to each statement about **fruit**.

Increasing my consumption of **fruit** costs too much money.					
It is difficult to find ways to fit **fruit** into my diet.					
It is difficult to increase my consumption of **fruit**.					
I feel that **fruit** is always available.					
I feel that **fruit** takes too much time to prepare.					
I feel that **fruit** is not tasty.					
Eating more **fruit** will help me manage my weight.					
I feel that I am helping my body by eating more **fruit**.					
I may develop more health problems if I do not eat **fruit**.					

17. Check the box that describes your agreement or disagreement to each statement about **vegetables**.

Increasing my consumption of **vegetables** costs too much money.					
It is difficult to find ways to fit **vegetables** into my diet.					
It is difficult to increase my consumption of **vegetables**.					
I feel that **vegetables** are always available.					
I feel that **vegetables** take too much time to prepare.					
I feel that **vegetables** are not tasty.					
Eating more **vegetables** will help me manage my weight.					
I feel that I am helping my body by eating more **vegetables**.					
I may develop more health problems if I do not eat **vegetables**					

The following questions will tell us how confident you are in including fruits and vegetables in your diet?

18. Check the box that best describes your confidence to each statement for **fruits**.

I can include **fruit** into my diet when I'm on a limited budget.					
I can eat at least 1 cup of **fruit** daily.					
I can eat at least 2 cups of **fruit** daily.					
I can eat at least 3 cups of **fruit** daily.					
I can keep **fruit** at hand/readily available.					
I can shop for a variety of **fruit**.					
I can make time to eat **fruit**.					
When I eat at home, I can eat more **fruit**.					
I can find ways to eat **fruit** at every meal.					
I can select **fruit** at the grocery store.					

19. Check the box that best describes your confidence to each statement for **vegetables**.

I can include **vegetables** into my diet when I'm on a limited budget.					
I can eat at least 1 cup of **vegetables** daily.					
I can eat at least 2 cups of **vegetables** daily.					
I can eat at least 3 cups of **vegetables** daily.					
I can keep **vegetables** at hand/readily available.					

I can shop for a variety of **vegetables**.					
I can make time to eat **vegetables**.					
When I eat at home, I can eat more **vegetables**.					
I can find ways to eat **vegetables** at every meal.					
I can select **vegetables** at the grocery store.					

The following questions will tell us more about your barriers and motivators to cooking.

20. Check the box that describes your agreement or disagreement to each statement.

Cooking takes too much time.					
I enjoy cooking.					
Cooking meals is expensive.					
If you know how to cook, it is easier to eat more fruits and vegetables.					
Cooking is hard.					
I feel comfortable in the kitchen.					

21. Check the box that best describes your confidence to each statement.

I can cook a nutritious meal.					
I can cook a meal in a short amount of time.					
I can cook a nutritious meal without spending a lot of money.					
I can follow a recipe.					

Appendix E: Program Feedback Survey

Program Feedback Survey
Please answer the following questions pertaining to the show series that you viewed. Please select only one answer for each question.

1) Please rate your overall enjoyment of the Good Grubbin' show series.

- ☐ Enjoyed very much
- ☐ Somewhat enjoyed
- ☐ Neutral
- ☐ Didn't really enjoy
- ☐ Didn't enjoy at all

2) Rate your overall interest in the topics that were covered on Good Grubbin'.

- ☐ Very interested
- ☐ Somewhat interested
- ☐ Neither interested nor disinterested
- ☐ Not very interested
- ☐ Not at all interested

3) I would like to view future episodes of Good Grubbin'.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Neither Agree Nor Disagree
- ☐ Disagree
- ☐ Strongly Disagree

4) I could relate to characters on Good Grubbin'.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Neither Agree Nor Disagree
- ☐ Disagree
- ☐ Strongly Disagree

5) I could relate to the challenges the students on Good Grubbin' faced.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Neither Agree Nor Disagree
- ☐ Disagree
- ☐ Strongly Disagree

6) Have you made any of the recipes that you saw on Good Grubbin'?

- ☐ Yes
- ☐ No

7) Do you intend to make any of the recipes that you saw on Good Grubbin'?

- ☐ Yes
- ☐ No

8) How many times did you view the Good Grubbin' website since viewing the first episode?

- ☐ I have never visited the Good Grubbin' website
- ☐ 1 time
- ☐ 2 times
- ☐ 3 times
- ☐ 4 times
- ☐ >4 times

9) Did watching this show make you more conscious of your eating habits?

- ☐ Yes
- ☐ No
- ☐ Not sure

10) Have you made any changes in your eating habits as a result from watching this show?

- ☐ Yes
- ☐ No

11) If you answered "Yes" to question 10, please write one or more examples of changes you have made.

_____

_____

_____

Appendix F: Mini Survey Completed After Viewing Each Episode

Intervention Group

1) Describe in 1-2 sentences the main theme or recipe of the Good Grubbin' episode you viewed this week.

2) On a scale from 1 to 5, how did you like the Good Grubbin' episode you viewed this week (5=liked very much, 4= liked, 3= neutral, 2=disliked, 1=disliked very much)?

3) On a scale from 1 to 5, please rate your interest in the topic of the episode of Good Grubbin' you viewed this week (5=very interested, 4=somewhat interested, 3=neither interested nor disinterested, 2=not very interested, 1= not interested at all).

4) Do you intend to try any of the recipes viewed on this week's episode of Good Grubbin' (Yes or No)?

5) Do you intend to try any of the nutrition tips viewed on this week's episode of Good Grubbin (Yes or No)?

6) Comments about the show?

Control Group

1) Describe in 1-2 sentences the main theme of the episode you viewed this week.

2) On a scale from 1 to 5, how did you like the episode you viewed this week (5=liked very much, 4= liked, 3= neutral, 2=disliked, 1=disliked very much)?

3) On a scale from 1 to 5, please rate your interest in the topic of the episode you viewed this week (5=very interested, 4=somewhat interested, 3=neither interested nor disinterested, 2=not very interested, 1= not interested at all).

4) Do you intend to try any of the health tips viewed on this week's episode (Yes of No)?

5) Comments about the show?

Appendix G: Sample Good Grubbin' Show Outline

FADE IN FROM BLACK

Scene begins in kitchen, Dawn tight on single, then wide on two shot

DAWN:
Welcome back. I'm here with TRAVIS who's in sort of a bind because his girlfriend is a vegetarian, and he's trying to plan a special 6-month anniversary dinner. Now what we've bought at the grocery store was pretty inexpensive, and actually doesn't really taste too bad. With that, because you and your girlfriend are big fans of Italian food, I thought we'd make the classic favorite, chicken parmesan but with a healthier twist. And for those of you at home saying that there's no way that a chicken substitute could taste as good as the real thing, I promise this meal won't disappoint, and it's extremely easy to make....

For the chick patties we've got to preheat the oven at 375 degrees. So while I'm doing that, TRAVIS, if you will just get our sauce going over low heat in a medium sized sauce pan that would be great. Now, you can make your own sauce too, but in the interest of money and convenience for this dish, I figured, why not just get the pre-made... Okay, so now that that's going.... I'm just going to get some water going to boil my noodles. Now, when you're putting water in the pot for noodles, it's really important to get enough in there. Usually, about two quarts of water is good enough for 3-4 servings of pasta...If there's too little water, it won't be cooked all the way through. So I'm just going to set that on the heat and get it going...

Okay, pretty easy so far, right?

TRAVIS:
Yeah, not to bad...just putting things over heat.

DAWN:
Good...alright...so while we're waiting on that, we need to get the chick patties going too. Now, if you'll notice, we're going to bake these patties. Not only are they healthy in and of themselves, but by baking them, you don't add any other oils to the meat like traditional friend chicken parmesean. All you have to do is spread these out over a baking tray, and throw them in the preheated oven for about 15 minutes...

TRAVIS:

Simple as that?

DAWN:
Yep...simple and easy...So now while that's all getting heated up, it's a good time to get our appetizer started. One of the most popular vegetarian ingredients in a lot of meals is hummus, but most people don't know how easy it is to make at home, and it's incredibly healthy. The main ingredient in hummus are garbanzo beans, or chick peas as a more common name. Those you can just pick up canned at the grocery store and drain them and they're really cheap. They're also incredibly healthy because they do count as a vegetable, but also have a ton of protein and fiber, which is why vegetarians should eat a lot of them. So to make hummus, we need to start with a blender...basically everything is going to get pureed together in the end to make delicious mixture.

STOPPED ACTION

So to start with, we've got one can of drained garbanzo beans, so it you'll throw those into the blender.

And then we need to throw a few cloves of garlic in there (*crust the cloves independently).*

And then 2 tablespoons of ground cumin...this will give it a nice smoky flavor.

And then lastly, we need a tablespoon of olive oil

And a 1/2 teaspoon of salt...

Then just blend that together until it's creamy.

END STOPPED ACTION

Okay, so then we're going to serve this with a veggie tray, and you can just pick one of those up, already made at the grocery store...and that's it, appetizer's done...

Now lets just check on the water..;.that's looking pretty good, so I'm going to throw the pasta in now. Now we're using whole wheat pasta, which adds a ton of fiber to the meal and makes the calories of the pasta a little bit more worthwhile. And usually you can find the whole wheat

pastas for about the same price. That needs to cook for about 7 minutes...so while that's going, we're going to take a break...But stay tuned as I finish up helping Travis put together a vegetarian feast for his 6 month anniversary...

GRAPHIC FLY THROUGH
FADE TO BLACK

FADE IN FROM BLACK

Scene begins with Dawn pulling the noodles off of the stove and pouring them into the strainer.

DAWN:

Welcome back. I'm here helping Travis prepare a vegetarian feast for his girlfriend. Our whole wheat noodles are just now ready, so we just need to pour those into a strainer. And our chick patties should also be about ready as well, so TRAVIS, if you wouldn't mind just pulling those out of the oven as well....

TRAVIS:

Sure...

DAWN; *(pulling the noodles and strainer out of the sink)*

Alright, those are looking pretty good... So then we're just going to actually grab a plate, and you want to make sure that you leave the oven on at about 375 or 350 because we're actually going to put the baking pan back in the oven after we're finished putting things together.

STOPPED ACTION

So, to begin getting these plates ready, we need to grab a couple of plates, and put one patty per plate.

Then put a serving of the noodles on the plate as well...

Then cover the noodles with the sauce that's been warmed…

And finally, sprinkle the top with a little bit of mozzarella cheese….

END STOPPED ACTION

Okay, that's looking good…now these need to go back in the hot oven for about another 10-15 minutes or until the cheese is melted and a little bit golden brown on the top…

STOPPED ACTION CUT AWAYS OF THIS...

Alright…so while that's getting finished up…let's make the essential…dessert, a fruit and yogurt parfait. Now, I usually buy frozen fruit because it stays fresh until you need it, and it's always available year round. Fresh berries will work well for this as well if you prefer, but the frozen ones are also considerably cheaper. So today I've got some frozen blueberries, and I'm going to put about a cup of them in a strainer and run them under hot water. And while I'm doing that, Travis, if you wouldn't mind slicing that banana for me…

STOPPED ACTION

Alright…and then we're just going to alternate layers of the yogurt and fruit…

CUT AWAYS OF THEM DOING THIS...

DAWN: (VO said though live mics)

And when you're making this dessert, you can also throw in chocolate chips or granola to change things up a little bit..

END STOPPED ACTION

Alright… those are done, and the chicken parmesan should be as well, so let's check on that…

Pull the meal out of the oven, which it finished

That looks perfect….and that's it, pretty simple…

TRAVIS:

Yep...defiantly, that wasn't too hard…

DAWN:

Awesome, and I'm sure she'll appreciate the extra effort you put into making this vegetarian meal for her…and that's it…

Well, that's all the time we have for today. And remember, if you want any of the recipies that you've seen today or anytime on our show, they're all on our website for you…Be sure to tune in next time as we make another delicious, nutritious meal on Good Grubbin…

Roll Credits

2 Weeks Later

TRAVIS:

Travis: My girlfriend was totally impressed by my cooking. She was especially excited that I actually served her vegetables. This whole experience has made me realize that cooking in general isn't that hard if you have the right recipes.

Appendix H: Consent Forms

Department of Food Science
and Human Nutrition
Fort Collins, Colorado 80523-1571
(970) 491-3819
Fax: (970) 491-7252
www.fshn.colostate.edu

Study Participant:

You are being asked to read an article about nutrition, cooking techniques, or exercise that is designed for the college newspaper and then complete a survey. The entire process will take about 15 minutes. This survey contains a variety of different questions relating to your health interests and your opinion of the article that you read. The title of this survey is: "The use of newspaper articles to disseminate information about nutrition, cooking techniques, and exercise to college students."

You may complete this survey if you are a student at Colorado State University. If you are 17 years of age or younger your results will not be included in the study. However, you may still complete the survey and be given class credit for doing so.

Your participation in this research is voluntary. If you decide not to participate in this study, you may stop participating at any time without penalty.

There are no physical, legal, or psychological risks involved in completing this survey. This survey may even help you recognize the mass media resources available on campus.

Please do no put your name on this survey. By completing the survey you are giving your consent that these answers may be used for data collection. Your results will be kept completely confidential and anonymous. Numbers will be assigned to each survey after they have been completed to analyze the data at a later date. The investigator will not know who filled out the questionnaire.

If you have any comments or questions regarding this survey please contact Dawn Clifford at (970) 491-1729. Thank you for taking the time to complete this survey.

Sincerely,

Jennifer Anderson, Ph.D., R.D. (Principal Investigator)

Dawn Clifford, R.D. (Co-Investigator)

COLORADO STATE UNIVERSITY
INFORMED CONSENT FOR PARTICIPATION IN RESEARCH PROJECT

PROJECT TITLE: Development of a Campus Television Program to Provide Nutrition Education for Students

FUNDING SPONSOR: Colorado Department of Public Health and Environment, Colorado Physical Activity and Nutrition

PRINCIPAL INVESTIGATOR: Jennifer Anderson, Ph.D., R.D.

CO-INVESTIGATOR: Dawn Clifford, M.S., R.D.

CONTACT NAME AND PHONE NUMBER FOR QUESTIONS/PROBLEMS:
Jennifer Anderson, Ph.D., R.D. (970) 491-7334
Department of Food Science and Human Nutrition

Dawn Clifford, M.S., R.D. (970) 491-1729
Department of Food Science and Human Nutrition

The purpose of this project is to determine college student's overall acceptance of a 30-minute pilot nutrition and cooking show.

You are being asked to watch a 30-minute television show with nutrition information and cooking tips as well as participate in a 30-minute focus group discussion.

You will be given 5 points extra credit for participating in the focus group by your EXCC145 instructor. Extra credit will be given regardless of your comments in the focus group discussion.

You may participate in these focus groups if you are a student at Colorado State University. If you are 17 years of age or younger you must first obtain your parent's signature for your answers to be included the in the study.

Your participation in this research is voluntary. If you decide not to participate in this study, you may stop participating at any time without penalty.

There are no known physical, legal, or psychological risks involved in participating in focus group discussions. Through watching this television show, you may even learn new nutrition tips and cooking ideas.

It is not possible to identify all potential risks in research procedures, but the researcher(s) have taken reasonable safeguards to minimize any known and potential, but unknown, risks. The Colorado Governmental Immunity Act determines and may limit

Colorado State University's legal responsibility if an injury happens because of this study. Claims against the University must be filed within 180 days of the injury.

Your results will be kept completely confidential and anonymous. A list of individuals who have participated in the focus groups will be given to your instructor so that class credit can be assigned. Your name will not be linked to your answers.

Questions about participants' rights may be directed to Celia S. Walker at (970) 491-1563.

Your signature means that you have read and understand this consent form, you have willingly signed it, and you have received a copy of these 2 pages.

_____
Participant name (printed)

_____ _____
Participant signature Date

_____ _____
Investigator or co-investigator signature Date

PARENTAL SIGNATURE FOR MINOR PARTICIPANT

As parent or guardian, you give permission for _____ (print name) to participate in the described research. The nature and general purpose of the project has been satisfactorily explained by _____ and you are satisfied that proper precautions are to be followed.

_____
Minor's date of birth

_____
Parent/Guardian name (printed)

_____ _____
Parent/Guardian signature Date

COLORADO STATE UNIVERSITY
INFORMED CONSENT FOR PARTICIPATION IN RESEARCH PROJECT

PROJECT TITLE: The Development, Implementation, and Evaluation of a Cooking Show for College Students

FUNDING SPONSOR: Poudre Valley Healthy System, Coalition for Activity and Nutrition to Defeat Obesity

PRINCIPAL INVESTIGATOR: Jennifer Anderson, Ph.D., R.D.

CO-INVESTIGATOR: Dawn Clifford, M.S., R.D.

CONTACT NAME AND PHONE NUMBER FOR QUESTIONS/PROBLEMS:
Jennifer Anderson, Ph.D., R.D. (970) 491-7334
Department of Food Science and Human Nutrition

Dawn Clifford, M.S., R.D. (970) 491-1729
Department of Food Science and Human Nutrition

The purpose of this research is to determine college students' reaction to a series of television programs.

You are being asked to watch one 15-minute television show a week for four weeks and complete a brief (5-minute) email survey after viewing each show. In addition, you are being asked to complete a survey (20 minutes) before and after the four weeks.

You will be given 5 points extra credit for participating in this research by your instructor. The 5 points will be credited upon completion of surveys conducted before and after the four week television-viewing experience in addition to the 4 brief e-mail surveys. All surveys will be conducted outside of class time. The expected time commitment for completing the surveys and viewing the television series is a total of 2 hours. Extra credit will be given regardless of your answers to the surveys.

You may participate in this research if you are a student at Colorado State University.

Your participation in this research is voluntary. If you decide not to participate in this study, you may stop participating at any time without penalty.

There are no known physical, legal, or psychological risks involved in participating in this research. Through watching this television series, you may even learn information that is beneficial.

It is not possible to identify all potential risks in research procedures, but the researcher(s) have taken reasonable safeguards to minimize any known and potential, but

unknown, risks. The Colorado Governmental Immunity Act determines and may limit Colorado State University's legal responsibility if an injury happens because of this study. Claims against the University must be filed within 180 days of the injury.

Your results will be kept completely confidential and anonymous. A list of individuals who have participated in the focus groups will be given to your instructor so that class credit can be assigned. Your name will not be linked to your answers.

Questions about participants' rights may be directed to Celia S. Walker at (970) 491-1563.

Your signature means that you have read and understand this consent form, you have willingly signed it, and you have received a copy of these 2 pages.

_____
Participant name (printed)

_____ _____
Participant signature Date

_____ _____
Investigator or co-investigator signature Date